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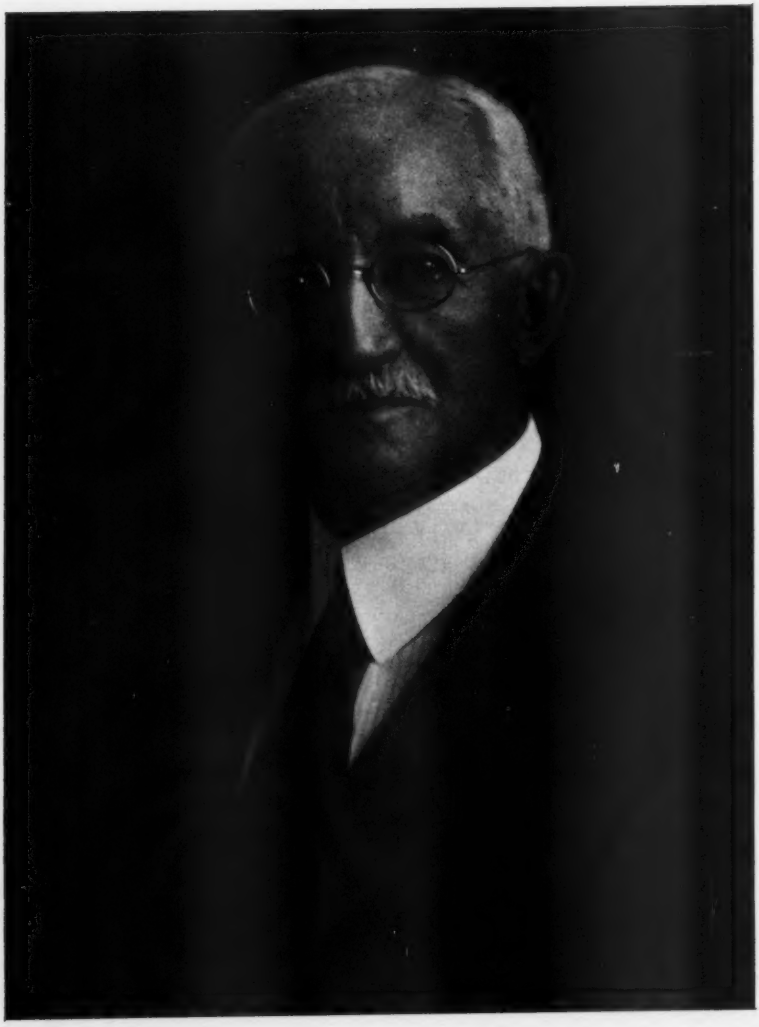

ARTHUR NEWELL TALBOT

ARTHUR NEWELL TALBOT

ARTHUR NEWELL TALBOT, Professor Emeritus of Municipal and Sanitary Engineering at the University of Illinois, was born at Cortland, Illinois, in October, 1857, was awarded the fifth Lamme medal by the Society for the Promotion of Engineering Education at its fortieth annual meeting, Oregon State College, June 29–July 1, 1932. He was graduated in civil engineering at the University of Illinois in 1881 and was awarded the professional degree of Civil Engineer in 1885.

His early engineering experience was chiefly in the fields of railway and municipal engineering. In 1885 he joined the faculty of the University of Illinois as Assistant Professor of Engineering and Mathematics, which position he occupied until 1890 when he was appointed Professor of Municipal and Sanitary Engineering in charge of the Department of Theoretical and Applied Mechanics. In 1926 he retired as Professor Emeritus, but since that time he has continued his research activities as vigorously as in his younger days.

During his long and successful career at the University of Illinois, Professor Talbot has had a marked influence on the development of engineering education and research through his work in the class room and laboratory and with his associates on the faculty. Of equal importance is the influence which he has had indirectly through the large group of graduates who carried his teachings and ideals as members of the faculties of many institutions in this country and abroad. In 1904 he wrote the first bulletin of the Engineering Experiment Station. Other bulletins and papers in the technical press have appeared under his authorship at frequent intervals, reporting his investigations in the fields of reinforced concrete and other structural materials, hydraulics, and mechanics. For many years he has been directing an extensive investigation of the stresses in railroad track.

As a consulting engineer, Professor Talbot has been active in nearly every phase of civil and sanitary engineering. He has

served on many commissions, including those selected to report the Galveston Causeway and the proposed San Francisco Bridge.

The esteem in which Professor Talbot is held by his fellow engineers is evidenced by his election to the office of president of the Society for the Promotion of Engineering Education, the American Society of Civil Engineers, and the American Society for Testing Materials; his honorary membership in the American Society of Civil Engineers, the American Society for Testing Materials, the American Waterworks Association, Western Society of Engineers, the Illinois Society of Engineers, and his selection for the Washington Award of the Western Society of Engineers, the Turner Medal of the American Concrete Institute, and the Henderson Medal of the Franklin Institute. Professor Talbot was given the honorary degree of Doctor of Science by the University of Pennsylvania, Doctor of Engineering by the University of Michigan, and Doctor of Laws by the University of Illinois.

Recognition has come to Professor Talbot from many fields, but his major interest has been that of engineering education.

ENGINEERING TEACHING IS A GOOD JOB

By R. A. SEATON

President of the Society

From the many applications for teaching positions flooding the mail of engineering deans, engineering teaching must now be regarded as a "pretty good job"! Even in these times of industrial stagnation and wholesale cutting of forces in industry, but few engineering teachers have lost their positions or suffered severe cuts in salaries. While some salaries have been reduced the reductions have generally been more apparent than real, because of the increased purchasing power of the dollar.

Engineering teaching is a "pretty good job," but it is also a profession that offers opportunity for employing, to the fullest extent, talents and abilities of a very high order. In shaping and directing the ideals and aspirations of young men who are preparing to enter the engineering profession, in grounding these men firmly in the fundamental principles and methods of sound engineering, in stimulating in them a desire to search out unknown truths and to develop new and improved applications of science, in carrying on and directing experimentation and research in the laboratories and in the field, and in collecting, classifying and publishing engineering knowledge, the engineering teacher plays a very important part in the advancement of human welfare. Engineering teaching is, indeed, a profession that challenges our very best efforts.

Why, then, should not every engineering teacher try, by every means available, to develop himself, to improve the quality of his work, and to fit himself for advancement to more responsible positions in the field of engineering education? Why should not every teacher of engineering students hold membership in, and actively participate in the work of, the Society for the Promotion of Engineering Education—the society of his profession? I believe every engineering teacher can profit greatly from such membership and work, but if there be those who have advanced so far that they cannot, themselves, profit, they have a public duty to share their knowledge with their less fortunate colleagues!

The Society has now about 2,300 individual members. There are probably twice as many more teachers of engineering students that should be members. Why are they not? Are they lacking in ambition and indifferent to self-improvement? Do they not value

their "jobs" highly enough to want to handle them better? Or have they not had the advantages of membership in the Society presented to them adequately?

Each Society member should scrutinize carefully the membership list for his own institution, as published in the year book, and try to interest his colleagues, who are not members, in Society membership.

Return to the Secretary, F. L. Bishop, University of Pittsburgh, Pittsburgh, Pa.

Society for the Promotion of Engineering Education

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COÖRDINATED ENGINEERING EDUCATION*

By H. S. EVANS

President of the Society; Dean, College of Engineering, University of Colorado

Education, all education not engineering only, is being severely criticized. Thousands of our most intelligent men and women have gone through our colleges and universities and our economic problems have not been solved. Many are saying that education has failed. Most of us can remember that during the progress of the World War one of the common complaints was that Christianity had failed. The charge was made that no such humanly conceived and executed catastrophe could be carried through if Christianity were genuine. No considerable number of our citizens believe that charge to-day. They agree rather that the catastrophe of the World War was possible only through the lack of application of true Christian principles to national and international affairs.

The charges against higher education will fail on these same grounds. Education itself and scientific research are of untold benefit to humanity but it is entirely possible to misuse these intrinsically valuable accomplishments, with the result that they may in some cases interfere with human welfare rather than promote its best interests.

Is it lack of knowledge or is it the lack of willingness to do what is known to be right that has caused our failures?

Is education placing enough emphasis on high ideals and right living? If it is charged that it is not, there may be some basis for such a complaint in the facts as we find them.

On the other hand, most of us like to believe that our young men and women finish their university courses with high ideals and open minds and then when they enter industry and its fierce and impersonal competition, they lose the effect of their earlier training. Is it not moral and spiritual values that need application and development? We should strive to develop more sympathy for our neighbor and " the understanding heart " in our attempts to solve our problems. Our young graduate usually enters his life work through the industrial organizations and often finds that he is overwhelmed in the mad rush of business, in order that salaries and profits may continue to grow, and he soon loses his real self and becomes a part of the great machine. I only speak of industry

* Presidential Address delivered at the 40th Annual Meeting, S. P. E. E., Oregon State College, Corvallis, Ore., June 29–July 1, 1932.

because it touches our field most definitely. The same criticism would apply equally to general business, and too often to the professions such as law and medicine.

The same school graduates the crooked politician and the statesman, the quack doctor and the great physician, the shyster lawyer or engineer, and the highest type of men in those professions. Is it education, science, or engineering that is to blame for our troubles, or is it the use of these things in the hands of those who have found in them the opportunities for excessive personal gain.

Industry is being criticized even more severely than education. Possibly our industrial leaders should have been wise enough to foresee the collapse in time to prevent or limit its most serious consequences but the fact that they did not is strong evidence that other factors were at work which were more definitely responsible than industry itself.

Production and consumption are out of balance, but we are now convinced that this condition is not due so much to over-production as it is to other economic factors in this and other countries.

When the history of this trying period is written I am sure it will be recorded that the leaders of industry were more active and effective in their efforts to restore normal conditions than were most other groups. It will be found that the politicians and financial leaders will be loaded with a greater share of the responsibility.

Mr. Harold Callender recently wrote an article for the *New York Times* which he called the "Mad Hatter's Economics," which beautifully satirizes either our lack of real education or our inability or unwillingness to apply what we do know. He begins his article by quoting from *Alice in Wonderland.*

"In that direction," said the Cheshire Cat, waving its right paw round, "lives a Hatter; and in that direction," waving the other paw, "lives a March Hare. Visit either you like; they're both mad."

"But I don't want to go among mad people," Alice remarked.

"Oh, you can't help that," said the Cat. "We're all mad here. I'm mad. You're mad."—From "Alice's Adventures in Wonderland."

"It's this way," said the Hatter, pouring himself a second cup of tea. "Our farmers produce too much wheat, our factories too many manufactured articles, our machinists too many machines. We're so efficient that we're miserable. Surely you understand that?"

"I'm afraid I don't," said Alice. "For if there's plenty of food and other things, everybody should be comfortable."

"Prices have dropped terribly," continued the Hatter. "That's what depresses us so."

"That's no reason to be depressed," said Alice. "I thought people complained when prices were high, so if they're low you should all be happy."

"No," said the Hatter. "We produce so well with machinery that we have less and less need of labor. So the workman can't earn wages and can't buy goods, and the things the factories make can't be sold."

("Then what's the good of making them?" wondered Alice.)

"We are very thrifty," the Hatter went on. "We save and pile up capital with which we build more and more factories, which become more and more efficient. The more efficient they get the more they produce and the fewer men they employ. So their products glut the markets and their machines create unemployment. We put so much capital into making goods that the consumer hasn't enough money to buy the goods when they are made."

"Oh dear!" said Alice. "Doesn't anybody know what to do about it?"

"There are economists," said the Hatter, "who have seen what was happening and warned us. But they are only scholars who lecture and write books. The practical men who run things have no use for the academic mind. But they know the value of the boll weevil."

"What is it good for?"

"It eats up the cotton crop and keeps prices from falling," explained the Hatter. "Were it not for the boll weevil we should have magnificent crops and then the South would be ruined."

"But what about the poor North which has too many factories; couldn't your boll weevil eat up some factories too?"

"No," said the Hatter disdainfully. "Besides we protect our factories with a tariff."

Alice sighed and wondered whether anything ever would happen in a reasonable way again. "Can nobody do *anything?*" she asked.

"Well, nobody *has* done much," answered the Hatter.

"But isn't it important to do something?" urged Alice.

"Of course—it is extremely important. Everybody knows that," said the Hatter.

Then Alice remembered what the Cheshire Cat had said.

In spite of all the confusion and the criticisms which have recently and are now being leveled at higher education, and particularly at science, engineering, and industry, we should not be discouraged. Most of this criticism is coming from those who are uninformed, or from a group that is attacking education in order to bring about a reduction in taxes, or from those who are simply seeking a convenient scapegoat on which to load our economic ills.

To keep silent or to follow in the wake of these critics is to seemingly admit a weakness which has little foundation in fact. Which is better for a man himself or for his country, whether he is employed or unemployed; an education or no education? Is truth right or wrong? Is it better to believe that the world is flat or to know its true form? Is it better to think that the sun revolves around the earth or that the earth revolves about the sun? Is it

better to think that disease and infection come from evil spirits or to know the real facts? Which is better, the smoke signal and the pony express or modern methods of communication? Which is better, the covered wagon or the automobile?

A general answer to all of these questions might be that the real value of all our new knowledge depends on the use which is made of it. It is not difficult to point out many unfortunate conditions which have grown out of our modern industrial system and we know that this system is based on scientific discoveries and their applications. We know that most, if not all, of these difficulties are due to faulty methods which may and will be corrected in time. Too often the benefits of science and engineering are forgotten or taken for granted while our economic and industrial ills are magnified and are not studied with sufficient care to determine the real underlying causes.

Of one thing we may always be confident. "Ye shall know the truth and the truth shall make you free."

We have heard much of the inarticulate engineer. He has been expected to do his job and do it well and leave the result to be used and appreciated by those who can profit from the works of his mind and hand. This conception of our obligations has seemed to work well in the earlier stages of the development of our profession but as the engineer has become more and more responsible to society and to civilization, it is increasingly evident that much remains to be done both by engineering educators and professional engineers in making our profession not only more articulate but more sensitive to the needs of society.

In order that we may meet these new conditions more effectively our attention is just now being focused on the united efforts of our national engineering organizations in their attempt to improve and coördinate the methods of selection of new recruits and the continued training of these young men through college and beyond until they are deemed worthy to be accepted into the engineering profession.

Because of the importance of this movement and because its success must necessarily depend upon the knowledge, interest, and active support of all of us, we adopted as the slogan for this Convention, "Coördinated Engineering Education."

This plan would lay its foundations in the preparatory school, carry on through the college and university into the graduate school and into industry, and should include practical and ethical applications of the principles and ideals of the engineering profession before the candidate may be certified as an engineer. The visible evidence of such acceptance may be legal registration, the granting of a professional engineering degree, and full membership

in our national societies, but unless and until the objective of the plan carries with it much more than formal requirements it will fall far short of its mission. That part of the definition of our profession " directing the materials and forces of nature *for the benefit of mankind* " must receive a new and greater emphasis if we are to be able to lead industrial processes out of the wilderness of depressions, and society into a more stable existence and into a greater enjoyment of the products of our efforts.

Many of us have been opposed to the licensing of the engineer, at least until more of his qualifications for successful practice were definitely established and more generally understood and recognized. In spite of this opposition, which in some of our organizations has taken the form of silent disapproval, the matter has been pushed so vigorously by other groups that licensing in one form or another is an accomplished fact in more than half of the states, and applies to considerably more than half of our total population.

If we are to make use of legal formulas enacted by state legislatures as one of the steps required for certification into our profession, it will be necessary for us to assist in the preparation of a model law which will best serve that purpose and then attempt to secure its legal enactment.

It has not seemed impossible to formulate more or less general ideals for registration, but when an attempt is made to put these ideals into effective practice many difficulties are encountered. Some years ago a National Council of State Boards was organized and this central group has been of great service in formulating and unifying the requirements for registration. As stated in the Constitution of the Council, its purpose is, " to promote uniformity of practice in the administration of State registration laws for professional engineers and land surveyors, to establish and maintain a system of national qualifications for registration, to provide for reciprocal relations between state boards, and to foster any movements having for their aim the promotion of the public welfare through engineering registration, and the improvement of professional standards."

If we are to work towards a more unified plan for the logical advancement and professional recognition of our members, the question of the professional engineering degree as now conferred by the colleges and universities of this country must be revived. In any individual case this degree now means very little, unless we are informed of the requirements of the particular institution by which it has been conferred. Its status in different schools now gives it a ranking all the way from the B.S. degree in engineering, usually conferred at the end of the ordinary four-year course, to an elevated position in other institutions where it is classified

alongside the Ph.D. This is an intolerable situation if the professional degree is to be used as one of the marks of certification.

The national professional engineering societies should also, through some coöperative agency, standardize their requirements for the different grades of their affiliates, in order that full membership in each of them shall be conditioned on the same or very similar degrees of professional attainment.

Coördinated engineering education, or coördinated education for the engineer now seems to be a larger job than we had supposed it to be. It involves many more agencies and more years of the young man's life than the usual four-year span of a college course. It should begin with the boy in the form of information for his guidance and tests to determine his special abilities and continue through young manhood. It becomes a problem of the preparatory school and the high school, possibly the grades even, then the university or senior college, then the graduate school, then industry.

Many incompetent or unsuccessful engineers would have been happier and more useful in other fields, and an even more serious indictment against our present system is the sixty per cent elimination during the college course.

The same charges could no doubt be brought against other callings and professions, but that fact only emphasizes our problem the more.

Our own investigation shows how inadequate is the information on which careers are chosen, and I dare say if this study did not seem conclusive that most of us could turn back the pages of time and there find that we personally made the choice on meager and often erroneous data which came to our attention more or less by chance.

The many successful engineers of today do not prove that they were in possession of adequate knowledge when their choice was made, but they do prove, rather, the wide range of adaptability of the human make-up.

I recall one of our engineering students who, after graduation, decided that he would rather practice medicine than go on with engineering. He attended medical school, secured his degree, became a licensed physician, and has conducted a successful practice, with not only no regrets for having spent four years in the exacting training of an engineering course, but with the definite conviction that this training had more than compensated him for the extra years spent in college.

When considering the large number of failures in the university, the high school blames the college and the college in turn blames the high school, but recriminations are valueless unless by that means the difficulties of the unfortunate student are brought to our atten-

tion so forcibly that we shall finally become really interested in his welfare and provide adequate and suitable training at different levels from which he may choose a program best suited to his individual capacity and needs.

Our attention has been frequently called to the lack of coherence in our national educational system. No definite plan is in evidence. Such national and state legislation as has been put into effect may be adequate for one type of education and entirely overlook the needs of some other type. We should sponsor some form of National Educational Commission, which must be non-political and unbiased in personnel to work out a national and state plan which would merit the united support of the entire country.

In our technical schools and universities there are thousands of young men who have neither the aptitude nor the interest to warrant their continuance in the standard engineering college. Many of these men would " find themselves " if a school for technicians of the vocational type were available, and many of our university students would gladly take advantage of this type of training if they were given the opportunity and if industrial organizations would formulate definite plans for their place in our present system of production, at the end of their educational training period.

Under the general topic chosen for this meeting we should as an organization of engineering colleges immediately formulate some plans for setting our own house in order in some so-called minor details, minor in comparison with many of the problems of which we are thinking but nevertheless illogical and unworthy of a well organized national plan of engineering education. I refer to the heterogeneous group of degrees conferred on our engineering graduates at the end of the four-year course; to the fearfully and wonderfully made transcripts of credits which follow our transfer students from one institution to another. In many cases an interpreter from the institution which issues it should be required to present the transcript in person in order to make it intelligible to the uninitiated. The bulletins in general are little better and are written for home consumption and interpretation only.

When the student himself is asked to assist in the interpretation of his own transcript, which plan is undesirable and should not be necessary, he is usually as much confused in attempting to answer specific questions as one would expect him to be from the nature of his transcript and the catalogue on which it is supposed to be based.

Our university curricula must be broadened and enriched. The teacher must first be a man with broad human understandings and sympathies as well as one who is qualified in his particular field.

Culture is no longer thought of so much in terms of the technical name of the subject taught as in the manner in which *any*

subject may be presented if the teacher has the proper background and the necessary sympathetic relations to his students.

To quote a paragraph from an address of President Norlin of the University of Colorado;

"Knowledge of one's subject, not only in itself but it its relationships, and reverence for that knowledge as an instrument of freedom; knowledge of one's students and reverence for what *they* have it in them to become—are these not the prime requisites of a pedagogy which may enlist the partnership of our students with us in the common business of education?"

And again as President Wickenden puts it, "Are we not tempted at times to take the curriculum too seriously, to look upon it too much as if it were a precise chemical formula?"

We object and rightly so to too much supervision and standardization in the details of our educational procedure, but lack of proper coördination leads to much hardship on the youth of our country which we should not be willing to tolerate with complacence. Industry has set us many examples of the necessity for planning and coördination. This is not confined to the inner workings of each organization itself, but must also be applied to different plants or companies which are engaged in producing the same type of products or which are furnishing a similar service.

The incandescent lamp base and socket are now standardized as to size and shape even though manufactured by unrelated organizations. In the early days each railroad company designed and had its equipment built to suit the ideas of its own staff. Track gauge and height of cars and couplings were not the same for different companies. As business grew and coöperation became a necessity these differences were corrected as a matter of course. Both business itself and the public have profited by such adjustments.

As has been said before, we do not believe in too much standardization in our educational processes, because we are dealing with human beings instead of material products, but there is much to be gained through coöperative efforts and a more definitely coördinated system of education.

If standardization should mean an attempt to set up a fixed curriculum, or the exact content of each course of study, or the method by which it must be presented to the students, or to interfere with many of the inner workings of our schools, we should very properly object to any such procedure. If a rating of engineering institutions were attempted by which we were to be classified in one, two, three, order from top to bottom we should rightly and most vigorously oppose any such impossible plan; on the other hand minimum standards below which any engineering degree will not be recognized would be of real service to the profession.

If we may for a moment speak in terms of the battlefield; in the past there has too often been a college trench, and a professional engineering society trench, and an industrial trench, and an ill defined and often dangerous no-man's land between each of them. We must remove the barbed wire entanglements and discover that we are all friends striving together for the same results.

Our schools and colleges have thought that their field must be confined to technical education; our professional societies to technical papers and discussions and to those matters which would advance the status of their members; while, as would be expected, industry has been striving for financial success.

No criticism of any one of these groups is intended, but I am sure we are now beginning to understand that the engineering profession as a great unit must definitely take its place alongside those other groups which are willing and ready to help in leading our country safely through this dangerous period of industrial and social development.

If this is true, what can we do about it? Quite obviously the first thing to do about it is to see that our associates in all engineering occupations shall be informed of our obligations and informed so definitely and repeatedly from many sources, that they will finally come to believe and then to become interested and active in our new programs and plans as they may be presented to us from our leaders who are actively at work on these problems.

This Society through our Board of Investigation and Coördination has done much in the study of engineering education in all of its phases. It remains for us to emphasize these suggestions if they are good and to put them into practice.

The scope of our interests has broadened. We must coördinate these interests. On the one hand we have the high school and the junior college, and on the other the graduate school and industry, and over all, our obligations to society and human welfare.

One of the agencies through which we have a new and greater opportunity for coöperation between the Society for the Promotion of Engineering Education and the founder societies is the American Engineering Council. As some of you know, we are now a regular member of this organization with Dr. Bishop as our official representative.

In our relations with the professional societies and with industry we should strive for coördination and closer coöperation but we must guard against attempted coercion or demands from either side. We should have a sympathetic understanding and the desire to work together on the problems which confront us and which we are now just beginning to visualize as common problems. Our objectives can no longer be isolated into separate fields of Engineer-

ing Education, Professional Engineering Societies, and Industry, for we see clearly that the most important lines of progress run unbroken through all of them.

Though we deny the charge that education or industry has been responsible for the stormy conditions which have come upon us, yet we should be up and doing and play our part in charting a safer course for the future—one that we hope may bring us to the goal of a better world and a more stable society, a world in which both work and recreation may be available for all, with underlying ideals that shall lead to the fuller and better life.

ADDRESS OF WELCOME

J. R. JEWELL

Dean, College of Vocational Education, Oregon State College

You all do realize that I am standing here as a pinch-hitter this afternoon. President Kerr is kept in Portland by the state board of higher education, and has asked me to welcome you to the campus. There is not any one of us in authority on this campus who could not welcome you to the campus with equal heartiness. You are in more or less of a peculiar institution and on more or less of a peculiar campus. The agricultural students over here do not even try to break up the parade on engineers' day in which they show a deplorable lack of school spirit, but even if lacking college spirit still we appreciate you.

If one is to do anything more than merely to assure you of your welcome, which you already know, one approaches the task with some diffidence, particularly if one happens to be known as a pedagogue, one who speaks in "pedaguese," our language.

I remember a librarian, a lady of universal knowledge in a university in which I once worked, who was said one day to have discovered a student puttering around the reference shelves too long for his own good, and who went up to him, stopped him, and said, "What do you want?"

He said, "I am looking for the Encyclopedia Britannica."

"It has gone back to the bindery. What do you want to know?"

I do not forget when my father came back from the World's Fair at Chicago telling about all the things he had seen at the White City; and he told me he thought he had seen the dawn of a new day, that marked the beginning of a new era. Then he proceeded to tell me of the marvels of the White City. If father had known of the S. P. E. E. he probably would not have told me of the things he saw, but of the beginning of a new era indeed.

I suppose the dean of the school or college of education, if he be honest (that "be" is a subjunctive, a kind of contrary-to-fact proposition, which gives you the benefit of the doubt), would say in a very few words that probably more or less modern deans of education look to you and the organization which you represent as the originators of modern pedagogy. I hope you will deal kindly with me; I had not meant to perpetrate that.

I should like, if I am able, to make this point. All down through the history of education, down through hundreds of years, clear

back to the beginning and up to about your day, maybe up to the founding of your organization in Chicago, they brought us up on the idea that knowledge was the exact equivalent of education. You could make an equation, like pan scales, and the more knowledge you poured into a child's head and weighed it down, the more his education came up to balance it. My engineering technic is not good, and my vocabulary may be pitiful, largely due to the fact that I was not brought up on it at all but was brought up on Webster's elementary blue book. I can spell anything in it now, including froantitransubstantiationableness. I do not know what it means, but that was not the point; I could spell it.

Let me attempt one illustration in your own vocabulary, having to do with the educational system under which the earlier generation grew up. My own elementary schooling was west of the American rain line, but the geography did not recognize that fact, and I was taught the names of all the capes and isthmuses and islands of the globe; just as if I had been a seaport child. My own education, such as it was, I have often thought comparable to my having been decorated with a certain number of electric light bulbs, particolored the Greeks would have called them, some red, some green, some blue; some bird-shaped some Santa Claus shaped, imported from wherever they come from for Christmas tree purposes, such as my father and mother decorated the Christmas tree with. But they never put in the plug till Christmas morning, after we had had our stockings and had had our breakfast. Then we had the tree. We children gathered around it in awe, waiting until father plugged the strings of lights in the socket when suddenly the tree was all lighted up, and as suddenly became beautiful.

The analogy is almost a perfect one. Back there a great many years ago they decorated me with diagramming and parsing and spelling and a maratime gazeteer and a lot of queer-shaped educational bulbs—and I have been waiting forty years for some one to turn on the juice.

One must not bore you. I want the opportunity, if I may have it, of saying five sentences and then leaving—perhaps six sentences.

Well, I think, ladies and gentlemen, quite clearly, that everything that as a boy they taught me to do, D-O, I either still can do it, or I could if you would let me. I am as serious about that as I know how to be. I think that everything, that as a boy, they taught me to do with my muscles I either still can do today, or if you would let me I could do it. Where I grew up, they did not dance, so I can not dance yet, but they played post office, and I could now, were there opportunity. They taught me to spell all of Webster's elementary blue book, and I still can. "Four times

a day there was a line across the floor where we children turned our toes at whichever angle nature spread that teacher's feet, and then we had to "spell down" through the book. I still can.

They taught me to write (I still write condemnably), "Virtue hath its own reward," Copy Book No. 5, Spencerian.

They taught me to read. Of course, they did not. They taught me to pronounce in a tone of falsetto, a full octave above my voice, but I learned to pronounce. If the teacher had said, "Read the page through and shut your book and tell me what you read about," I should have thought her crazy, and so would the school board. But I can pronounce yet.

They taught me to diagram. I presume that is "pedaguese" again, but I still could, were you to let me. They taught me to parse. Kiss is a noun both common and proper, not very singular, and agrees with you and me. I did learn how to parse it, but I never did learn how to go out and get one properly.

If I may say to you what I think my point is—no one to this good day in 1932 has ever yet accused me of knowing how "to language," and if you think that is poor English, think it. There was not any such thing as "languaging" in my day. We diagrammed, and I still can—I mean I could. I have not had a chance to parse since I left school, but I could had I the chance.

Any kind of knowledge whatever, that is to say, was considered to be education. Today even we pedagogues have entirely abandoned that idea. Our idea of education has become more or less scientific—at least much more scientific than ever it was before. We had and use our graphs, we have and use our cost sheets, we have our systems of child accounting.

I hope you ladies and gentlemen of the S. P. E. E. will see that we have been converted; here we are at the mourners' bench. We have "come through," as those of us from the South would say, and we even shout a bit now and then. We have even accepted your definition of education, namely, that education is teaching and training a child to do with his muscles what he wants to do with his mind. And if that is not a very complete definition of education, at least it is a lot better than the old one.

Possibly the way is being cleared for the one remaining step. Here on this campus, partly due to the efforts of Dean Rogers of the School of Engineering, one more important advance is being made. There is the dawn of a new day along the horizon. Good as this philosophy of education is, there is something even better yet—the education of the feelings, the teaching our boys and girls to love those things that God made lovely, and to hate those things that, God knows, deserve to be hated; the teaching of appreciations. Educated feelings are even more necessary than increments of

knowledge, and even more fundamental as springs of action and as governing conduct. The improving of attitudes and reactions may be not scientific at all, but it is a beautiful thing to contemplate.

Your idea of education has come to fruition. We hope ours may. We welcome you to Oregon State. Won't you have a good time?

YEAR BOOK 1932–33

The Executive Committee, after careful consideration, deemed it advisable to follow the practice of some of the other engineering societies in omitting the publication of a complete year book for the year 1932–33.

A comprehensive supplement, which will contain the names of new officers, members of Council, committees, new members, resignations and deaths, changes and corrections, will be issued as a supplement to the 1931–32 year book.

The Executive Committee asks your cooperation. Please send all corrections to the last year book, changes, etc., to the secretary, F. L. Bishop, University of Pittsburgh, Pittsburgh, Pa. This information should be in his hands not later than October 15 in order that the supplement may be published in November.

MINUTES OF COUNCIL MEETINGS

Present: H. S. Evans, H. H. Jordan, D. S. Anderson, F. L. Bishop, H. S. Boardman, I. C. Crawford, L. E. Conrad, B. G. Elliott, M. S. Ketchum, D. S. Kimball, O. M. Leland, J. E. McDaniel, C. F. Scott, R. I. Rees, A. N. Talbot, E. R. Wilcox.

The report of the Secretary was presented and will be printed in the JOURNAL. Motion that the Publication Committee be empowered to abstract articles.

Motion that Council recommend to the Society that the fiscal year close June 15.

Report of the Treasurer read and accepted and will be printed in the JOURNAL.

Chairman Rees reported progress of the Engineering Foundation Educational Committee in the preparation of information in pamphlet form.

Chairman Rees reported on certification into the profession. Motion that the Council of the Society for the Promotion of Engineering Education approve the plan for joint action as contemplated by the Engineers Council for Professional Development, as recommended by the Conference on Certification into the Profession, April 14, 1932, and that the plan be presented to the members of the Society for adoption at the present annual meeting. (See complete report on page 36 of this issue.)

Motion that the Council recommend that the Society proceed with its participation in the plan when five of the sponsoring bodies have ratified it; also that the committee be continued.

Chairman Scott reported progress on placing illumination in engineering curricula and upon motion the committee was continued.

The request for a meeting of personnel officers in 1933 was laid on the table.

Motion that the report of the Nominating Committee be presented at the annual dinner on Thursday.

Invitations from twelve chambers of commerce, the Western Society of Engineers to meet in Chicago in 1933, and from Cornell University were presented to Council. Motion that we meet in Chicago in 1933 was carried.

Motion that we participate in the joint session of engineering organizations June 28, 1933, and the Program Committee is authorized to proceed with a program for that meeting.

Chairman Barker reported progress for the Committee on Comprehensive Examinations at the end of the Sophomore Year. Motion that the Society for the Promotion of Engineering Education approves the agenda proposed by the Committee on Comprehensive Examinations relating to engineering examinations; that the Society believes a complete and impartial study should be made and that the Committee be continued and encouraged to secure funds for carrying on the study and that a report of its work be made annually to the Society.

Council expressed its approval of the incorporation of the Society and instructed the Executive Committee to proceed.

Chairman Scott reported the progress of the work of the Board of Investigation and Coördination.

The Secretary presented the survey on placement of 1932 engineering graduates. This was accepted and the survey is to be continued.

J. A. L. Waddell requested that the Society sponsor a book on "Vocational Guidance in Engineering Lines." No action taken.

Chairman Anderson reported on Sections and Branches. The report was accepted with the appreciation of the Council. Motion that Council approve the formation of the two sections on the Pacific Coast.

The following new members were elected:

CAUGHEY, CLARENCE H., Designing Engineer, Barber Greene Company, 6 So. Fordham Avenue, Aurora, Ill. H. S. Evans, J. A. Hunter.

DELL, GEORGE H., Instructor in Civil Engineering, University of Illinois, Urbana, Ill. W. H. Rayner, J. J. Doland.

DOERINGSFELD, HARRY A., Assistant Professor of Mathematics and Mechanics, University of Minnesota, Minneapolis, Minn. O. M. Leland, W. E. Brooke.

DUMBLE, WILSON R., Instructor in English, Ohio State University, Columbus, Ohio. S. A. Harbarger, John M. Weed.

EASTMAN, ALBERT S., Professor of Chemistry, University of Delaware, Newark, Del. R. L. Spencer, W. F. Lindell.

GIESY, PAUL M., Associate Professor of Chemistry; in charge Dept. of English, Newark College of Engineering. Newark, N. J. Paul E. Schweizer, J. C. Peet.

GUILD, LAWRENCE R., Professor of Commercial Engineering, Carnegie Institute of Technology, Pittsburgh, Pa. R. M. Ihrig, Wm. E. Mott.

HAMDI, ABDULLAH F., Engineer, Hall Electric Heating Company, 26 Roum, fort Avenue, Mt. Airy, Philadelphia, Pa. O. W. Walter, N. L. Towle.

KILE, ROBERT F., Assistant Professor of Mechanical Engineering, A. & M. College of Texas, College Station, Texas. V. M. Faires, F. C. Bolton.

OSBURN, ORREN E., Assistant Professor of Electrical Engineering, State College of Washington, Pullman, Wash. R. D. Sloan, H. V. Carpenter.

WEISHAMPEL, JOHN A., Instructor in Physics, Newark College of Engineering, Newark, N. J. F. N. Entwisle, J. C. Peet.

WIDDOP, ROBERT, Assistant Professor of Engineering Drawing, Acting Head of Department, Newark College of Engineering, Newark N. J.

The following budget for 1932–33 was approved:

Income

Dues:		
Institutional	$1,750.00	
Individual	8,500.00	$ 10,250.00
Back		500.00
Advertising		1,500.00
Sale of Publications		500.00
Interest		180.00
Estimated income		$ 12,930.00

Expenses

Meeting	$ 500.00	
JOURNAL and Proceedings	6,000.00	
Committee Expenses	150.00	
Secretary's Honorarium	1,200.00	
Clerical Assistance	3,300.00	
Sundry Printing	300.00	
Postage, Telegraph	250.00	
Supplies	100.00	
Travel, Secretary's Office	500.00	
Dues:		
American Council Education	100.00	
American Eng. Council	250.00	$ 12,650.00
Estimated Surplus		$ 280.00

FORTIETH ANNUAL MEETING OF THE SOCIETY

The fortieth annual meeting of the Society for the Promotion of Engineering Education was held at the Oregon State College, Corvallis, June 29 to July 1, 1932, and was one of the most successful meetings the Society has ever held. Its success is not marked by numbers (363 registered) but by the excellent papers and reports presented, and the interest which was maintained throughout the entire meeting. We can not say which meeting or conference was the most important. It was a combination of all, together with the good fellowship which prevailed, that made for success. A member in the West writes: "I found the meeting at Oregon so delightful that I am regretting my inability of the past thirty years to attend meetings of the Society in the East. I have lost much, I am sure, in personal friendships by my lack of contact with my colleagues in Eastern faculties."

Business Sessions

The opening session was held on Wednesday afternoon, June 29, 1932, with President H. S. Evans, Dean of the College of Engineering, University of Colorado, presiding. Dr. James R. Jewell, Dean of the College of Vocational Education of the Oregon State College, substituting for President Kerr who had been called to Portland, welcomed the Society to the college. President Evans responded for the Society and then gave his Presidential Address, "Coördinated Engineering Education." He called our attention to the fact that education, not engineering only, was being severely criticized. He asked if it was education, science or engineering that is to blame for our troubles, or was it the use of these things in the hands of those who have found in them opportunities for personal gain. President Evans claims that coördinated engineering education is the plan which would lay its foundations in the preparatory schools, carrying on through the colleges and universities into the graduate and into industry and should include practically an ethical application of the principles and ideals of the engineering profession before the candidate could be certified as an engineer. He believes in the coördination of schools and colleges, professional societies and industries in order that the engineering profession, as a great unit, might take its rightful place in the economic world.

Dean Ivan C. Crawford, University of Idaho, gave a very interesting and comprehensive "History of Engineering Development in the West." Director H. P. Hammond reported on the two schools

for teachers of engineering held last summer and the two to be held this summer—Economics at Stevens Institute of Technology, and English at the Ohio State University. The reports of the Secretary, F. L. Bishop, and of the Treasurer, W. O. Wiley, were read. The following Committee on Resolutions was appointed: C. W. Park, University of Cincinnati, Chairman, Charles Derleth, Jr., University of California, E. P. Hamilton, New York City, J. A. Junter, University of Colorado, and A. P. Poorman, Purdue University.

At the second session held Thursday morning, June 30, Vice-President D. S. Anderson, Tulane University, presided. Dexter S. Kimball, Cornell University, Chairman of the Committee on Graduate Work, reported for that committee. He also presented a paper, "Whither Engineering?" Walton C. John, Office of Education, read his paper, "Development of the Masters' Degrees in Engineering between 1925 and 1930." Maurice Holland, National Research Council, presented a paper, "The Peak of Research in the Valleys of Industrial Depression." This paper was originally scheduled for the conference on research but in order that all the members attending the meeting might benefit by it, the paper was presented at one of the regular business sessions. R. I. Rees, American Tel. & Tel. Company, Chairman of the Committee on Coöperation of this Society with other engineering societies, reported for that committee.

The Society approved the plan for joint action as contemplated by the formation of the Engineers' Council for Professional Development as recommended by the conference on certification into the profession, April 14, 1932, and also that the Society for the Promotion of Engineering Education proceed with its participation in the plan when five of the sponsoring bodies have ratified it. (Since our meeting at Corvallis, this plan has been ratified by five sponsoring bodies.)

The annual dinner was held in the spacious Memorial Union and President Evans presided. A musical program was rendered by Misses Marie Milletich, Iris Gray, Helen Wood Hoyer, and Mr. Paul Petri. H. S. Boardman reported that the Committee on the Lamme Award for 1932 had selected, as the recipient of the medal, Arthur Newell Talbot, Professor Emeritus of Municipal and Sanitary Engineering, University of Illinois. President Evans, in presenting the medal, said: "Arthur Newell Talbot, engineer, teacher, research worker, author, writer and friend of youth, your life has been given to the service of others and the eminence which you have attained in your contributions to science will ever remain a monument to your memory. Many young men who have been successful in their careers owe much to your guiding hand. May many

more years be added to your fruitful life. I present you this medal duly awarded by the Society for the Promotion of Engineering Education as an emblem of the love and respect of your friends and colleagues." Professor Talbot, in a few well-chosen words, thanked the Society for this high honor.

Dean H. S. Rogers, on behalf of the Oregon State College, presented President Evans with a gavel made of myrtle wood. President W. J. Kerr, Oregon State College, made a short address, and Karl T. Compton, President, Massachusetts Institute of Technology, delivered the address of the evening, "Cultural Aspects of Engineering Education."

The Nominating Committee presented its report and the following officers and members of the Council were unanimously elected:

President: R. A. Seaton, Kansas State College.
Vice-Presidents: Paul Cloke, University of Maine, H. S. Rogers, Oregon State College.
Secretary: F. L. Bishop, University of Pittsburgh.
Treasurer: W. O. Wiley, Jno. Wiley & Sons, New York City.
Council members to serve 1932–35: W. M. Cobleigh, Montana State College; H. B. Dirks, Michigan State College; F. E. Johnson, Iowa State College; Morland King, Lafayette College; C. W. Park, University of Cincinnati; A. P. Poorman, Purdue University; Harry Rubey, University of Missouri.

President-Elect Seaton was escorted to the platform and introduced to the group.

"I first became a member of this Society a good many years ago, and for some years was unable to attend the meetings of the Society, or thought I was unable to do so, but I always felt I received full value for my membership in the publications of the Society. Then some ten or fifteen years ago I attended a meeting of the Society, and I made up my mind at that time that thereafter only very exceptional circumstances would prevent me from attending every meeting of the Society. I have had to miss only one, I think, since that time, and I have always felt more than fully repaid for the expense in money and time spent in attending the meetings.

"Many of you are this year probably attending the annual meeting of the Society for the first time. I hope you will make similar resolutions and will decide now to attend all of the meetings of this Society, because I think very great inspiration and help come to us from these meetings and we are enabled to do our work in engineering education very much better because of the inspiration we get, the contacts we make, and new things we learn at the meetings.

"I am a charter member of the Kansas-Nebraska Section of the Society, one of the first sections organized, and I was very much pleased today when definite action was taken looking toward the organization of two or more sections of the Society on the Pacific Coast. I believe these sections are very well worth while in bringing to the younger members of the faculties, and others who cannot attend the meetings of the parent society, much of the inspiration and help that come from these meetings. I believe the Kansas-Nebraska Section has been of great value to engineering education in the states of Kansas and Nebraska, and I hope these two or more sections which are about to be formed here on the Pacific Coast will mean as much to you in this section of the country as the Kansas-Nebraska Section has meant to us.

"In the work I have had the pleasure of doing in this Society, of which Dean Evans has spoken, I have found always the very fullest and friendliest coöperation from all the members of the Society. I want to bespeak for all the officers of the Society next year a continuation of that same help and coöperation. One man or one set of officers can do relatively little to make a successful year for the organization, but if we all join in and help, as I am sure we will do, then I think we can look forward to a very successful year next year."

The final business session of the Society was held on Friday afternoon, July 1, and President Evans was in the chair. Charles Derleth, Jr., University of California, presented his paper, "Instruction in Industrial Relations on the Pacific Coast." Secretary Bishop made the following report on the survey of the 1932 engineering graduates who had been placed in engineering positions as of June 1, 1932. Seventy institutions reported 7,128 graduates.

Division	Graduates	Graduates Placed	Per Cent
Chemical	906	180	20.0
Civil	1,246	279	16.5
Electrical	1,734	238	13.7
Industrial	294	93	31.3
Mechanical	1,489	269	17.8
Mining	306	95	31.4
Others	628	119	18.9
	6,603	1,273	19.2 Aver.

F. L. Everett, University of Michigan, gave an address on "Experimental Course in Mechanics of Materials," which was illustrated by lantern slides. C. W. Park, Chairman of the Committee

on Resolutions, presented the following report which was unanimously adopted by a rising vote:

As we near the close of the fortieth annual meeting of the Society for the Promotion of Engineering Education, we can appreciate the careful planning which has resulted in a series of profitable sessions. The direct and earnest discussion centering around the idea of coördinated engineering education has given us a new perspective on the broad relations and the manifold responsibilities of the engineering profession. Conditions at this year's convention have been especially favorable to the renewal of acquaintance and the formation of pleasant and stimulating contacts. The delegates have constituted an informal community of the type which obtains a maximum of benefit from the interchange of ideas and experience.

The members of your committee are not unmindful of the high standards of hospitality which have become traditional for these annual conventions. It is therefore high praise to record that the entertainment provided by the various committees of the Oregon State College has been outstanding. In their attention to the minutest details, anticipating every wish of the delegates, these committees have functioned with a smoothness that could not be surpassed. The cordial greeting at the moment of arrival, the ready transportation, the thoughtful and appropriate compliment expressed by the plate of Oregon fruit and the bouquet of Oregon flowers awaiting each guest at his comfortable living quarters, the gracious attention shown to visiting women and children, the complete arrangements for all forms of recreation known to an outdoor region, the unfailing coöperation of a salubrious climate—these are a few of the memories of delightful western hospitality which will be carried away by grateful delegates and cherished in the years to come.

In view of the cordial reception prepared by our hosts and of the timely discussions arranged by the officers of the Society, it is a pleasure to find that this year's convention has been well attended. Besides the western colleges, whose entire faculties may be classed as present or accounted for, the schools from other sections of the country have been surprisingly well represented. We note with gratification that the far-distant University of Maine has twenty-five per cent. of its membership in attendance, or six out of twenty-four. Three members from the Georgia School of Technology show a similar enthusiasm and a corresponding disregard for distance. At a time so unpropitious for faculty travel, the excellent attendance indicates a wholesome condition of the Society and a serious interest in its aims and purposes.

Conferences

The success of the conferences was due to the work of the chairmen and their committees who developed the programs.

Civil Engineering. A. H. Fuller, *Chairman.*

An Analysis in the Structural Field of the Performance of College Men after Graduation. Albert Reichmann, Assistant Chief Engineer, American Bridge Company.

Coöperative Engineering Education. G. W. Burns, *Chairman.*

Modern Educational Philosophy and the Coöperative Idea. Allan R. Cullimore, Newark College of Engineering.

Coöperative Training in the Applied Arts. R. F. Stockdale, University of Cincinnati.

Round table discussion: Current Problems of Coöperative Education. R. C. Disque, Chairman.

Drawing. H. M. McCully, *Chairman.*

An Engineering Drawing Competition.

Practical Problems in Descriptive Geometry.

Electrical Engineering. F. Ellis Johnson, *Chairman.*

What will be the effect of the present depression upon the training of men for electrical engineering?

English. Amy V. Hall, *Chairman.*

Coöperation between the Teachers of Engineering and of English. H. P. Hammond, Director of the Summer School.

Specific Needs of the Engineering in English. Ivan C. Crawford, University of Idaho.

Symposium: The Present Status of English in the Engineering and Technical Schools of the West.

a. Coöperative Correction of Papers. E. R. Wilcox, University of Washington.

b. Types of Courses: Basic Composition; Technical Writing; Broadening and Cultural Content.

Discussion led by C. W. Park, University of Cincinnati.

Industrial Engineering. E. B. Norris, *Chairman.*

Gage Checking Laboratory at Stanford University. A. B. Domonoske.

The Teaching of Engineering Valuation. Anson Marston, Iowa State College.

The Industrial Engineer and the Small Industry. Gilbert S. Schaller, University of Washington.

Institutional Division. H. H. Jordan, Vice-President, *Chairman.*

Report of Committee on Instruction in Industrial Relations.

Report of Committee on Comprehensive Examinations.

The Junior College Movement on the West Coast, B. M. Woods, University of California.

What the Junior College Can Do for Engineering Education. R. E. Davis, University of California.

Technical Institute Education in a Coördinated System of Engineering Education. Robert H. Spahr, General Motors Institute of Technology.

Engineering and Technical Education at Pasadena Junior College, Arthur G. Gehrig.

Success of the University of Pittsburgh Branch Junior College Students after Transfer. F. W. Shockley.

Semi-Professional Engineering Education. F. E. Ayer, University of Akron.

This Division recommended to the Council of the Society the approval of the agenda and continuation of the Committee on Comprehensive Examinations for further work along the lines of the agenda. (Council later approved this recommendation.)

Machine Design. Frank L. Eidmann, *Chairman.*

The Ideal College Course for a Designer. S. B. Gorbutt, Willamette Iron and Steel Works.

Teaching Machine Design to Others than Mechanical Engineering Students. Robt. H. G. Edmonds, University of Washington.

Mechanics. A. P. Poorman, *Chairman.*

The Selection of the Young Teacher of Mechanics and his Subsequent Training. Evan Thomas, University of Vermont, and E. F. Chandler, University of North Dakota.

The Exchange of Teachers between the Department of Mechanics and Other Closely Allied Departments. T. T. Eyre, University of Southern California, and M. L. Enger, University of Illinois.

The Conduct and Content of Courses in Mechanics to Serve Best the Various Departments of the Engineering College. J. B. Reynolds, Lehigh University, and M. K. Snyder, State College of Washington.

The Use of Calculus Diagrams in the Teaching of Mechanics. A. L. Miller, University of Washington.

Research. R. A. Seaton, *Chairman.*

Increasing Importance of Research in Engineering Education. C. E. Magnusson, University of Washington.

Relationship of Engineering Research to Engineering Education. A. N. Talbot, University of Illinois.

Ways and Means of Stimulating Research in Engineering Colleges and Appraising its Value. H. V. Carpenter, Washington State College.

Report of Progress of the Committee on Bridging the Gap between the Universities and Industry of the Division of Engi-

neering and Industrial Research, National Research Council.
J. W. Barker, Columbia University.

Note: Another address sponsored by the Committee, "The Peak of Research in the Valleys of Industrial Depression," by Maurice Holland, National Research Council, was given at the second business session of the Society on Thursday, June 30.

The conference endorsed the following proposal by the Committee on Bridging the Gap between the Universities and Industry:

"That there should be convened in approximately nine different places throughout the United States, geographically separated, conferences of the various directors of research and deans of engineering or of specially appointed men from each of our different educational institutions who would come to these conferences prepared to discuss and measure by a to-be adopted yardstick for each region the research capacities of each of these various institutions. We believe that by this conference method, where people can be brought together to discuss face to face frankly and courageously this problem, we might evolve in each of these localities an individual yardstick by which the research capacities—taking into account the fact of personnel, attitude of administration and material facilities—may be evaluated. Finally, there shall be convened a national conference at which representatives of each of the nine district conferences shall get together and again attempt to weld these yardsticks into one."

REPORT OF THE SECRETARY, 1931–32

F. L. BISHOP

There are two matters coming before Council of great importance to the future of engineering education, namely, the certification into the engineering profession, and the position of graduate work which, in its increasing demand, may be tending to make the engineering college of the future graduate schools. In order that Council may have ample time to consider these two important questions, I am making the Secretary's report brief.

The office of the Secretary is the service department of the Society. To it each year many members write or come to secure information and assistance in problems which confront them in their work. The value of the Society to its members is sensed by these inquiries and visitors. The year now closing has been marked by unusual demands and your Secretary wishes to take this opportunity to thank those members who have so willingly coöperated with him in meeting this demand. Visitors range from those who "Just dropped in so I would know what you look like when I write to you" to those who have serious problems or difficulties. The correspondence has been voluminous and has come from all parts of the world. Some have requested loans of money so they could go to school; some wanted Ph.D. degrees from a good university by correspondence; how does M. I. T. compare with Pratt; how can I get my family into the country when our quota is filled; how can we restrict the importation of skilled engineers, etc.

We, as educators, should concern ourselves with the young men in high schools who wish to enter engineering colleges. When these young people write to this office seeking information we always give them the name and address of a member of the S. P. E. E. in their city and ask them to talk to this member. Sections and branches might be listed in high and preparatory schools and meetings arranged with boys who are preparing for engineering.

Council, at the Ohio State meeting, voted to join the American Engineering Council and authorized the Executive Committee to take the necessary action, provided the funds of the Society warranted it. The matter was brought to the attention of Council at Montreal and at Purdue and negotiations carried on with the American Engineering Council. These culminated in the past year by the election of this Society as a member-organization of the Council. In their Engineering News of May, 1932, the following announcement appears:

"Final arrangements have been completed whereby the Society for the Promotion of Engineering Education becomes a member-organization of the American Engineering Council. This is an extremely important step in the development of the organization of the engineering profession because the Society for the Promotion of Engineering Education is the foremost exponent of engineering education in the United States. It is an organization composed of 2,274 members, largely teachers and professors in engineering colleges.

"Many problems of concern to the engineering profession which are acted upon by American Engineering Council involve intimately the future of engineering education. . . ."

The Society has, for a number of years, been a member of the American Council on Education and has three delegates—L. W. Wallace of American Engineering Council, C. H. Warren of Yale University, and the Secretary. At the annual meeting of the Council in May, the Secretary was elected to serve for a period of three years as the representative of the Society on the Executive Committee of the American Council on Education.

The membership at the present time is 2,419 compared with 2,383 in 1930–31. This increase is made up of 143 new members. We have lost through death 15—Charles Day, J. H. Edwards, F. M. Hartman, F. J. Holder, J. S. A. Johnson, O. H. Landreth, E. F. Lawrence, C. L. Mees, C. I. Palmer, Harold B. Smith, J. Hammond Smith, George F. Swain, J. W. Votey, S. T. Wagner and C. W. Watts—by resignations 56, and 37 were dropped, a total of 108, making a net gain of 35. Of the members on the roll, 84.6 per cent. paid the current dues. This percentage has been approximately 85 for some time.

The fourth Lamme Award was made to Dugald Caleb Jackson for achievement in engineering education. The other recipients of the Lamme medal are George Fillmore Swain, Irving Porter Church and Charles Felton Scott.

We circularized all engineering colleges this year in an attempt to secure a list of vacancies so that we might assist those members who wished to change their location. Six such vacancies were listed and 150 letters of application were received.

Two summer schools for teachers of engineering will be conducted by the Society this summer—Economics at Stevens Institute of Technology, and English at The Ohio State University.

Vice-President D. S. Anderson has been in charge of Sections and Branches this year. One new section—Missouri—was formed. Nine meetings were reported to this office with an approximate attendance of 575.

A report of the Board of Investigation and Coördination covering the technical institutes was issued during the current year and a summary made by Dr. Wickenden was sent to each member of the

Society. Ten thousand copies of this summary were printed and the supply is almost exhausted.

The JOURNAL OF ENGINEERING EDUCATION contained over 1,000 pages this year. I should like to raise a question in regard to the JOURNAL and that is the fact that at the present time about 75 per cent. of the space is taken up with the printing of papers and addresses delivered at the annual meeting or at meetings of sections and branches. This leaves a small amount available for papers by members of the Society which would be of very great interest. We have a number of such papers presented for publication and it is impossible to include them in the JOURNAL. I should like to ask the Council to consider the advisability of asking authors presenting papers before these meetings to abstract them for publication in the JOURNAL.

A complete author, title, and subject index of the last volume of the JOURNAL was prepared with the coöperation of Mr. E. H. McClelland, Technology Librarian of the Carnegie Library of Pittsburgh. Considerable progress has been made on the preparation of a complete index of the *Proceedings* and of the JOURNAL. This involves not only a very large amount of work but the expense of publication would be considerable, approximately $2,000. I believe, however, such an index would be of value to members and it would be of material assistance to the Secretary. We frequently have requests for an article that was published "about 1910 to 1914 by some author from some institution and I am not sure just what the title was but it had this particular expression in it. . . ."

The call for the *Proceedings* remains about constant—400 copies.

Last year there was published, as a supplement to the JOURNAL, a report by Dean Seaton's Committee on Research. Closely related to that is graduate work, a preliminary report of which will be presented by the chairman, Dexter S. Kimball, at this meeting. I believe this report should receive wide circulation.

Much pleasure comes to the Secretary from the fact that the members are not lacking in a sense of humor. When the notice was first published that an increase in postage would be effective about July 1, the Secretary's office immediately prepared and sent out bills for 1932–33 dues which are payable in advance July 1. This action met with the approval of many of the members as evidenced by the notes received. The consensus of opinion seemed to be that "I am also Scotch. While you save only postage, I hope to save both postage and tax on the check by paying a few days in advance." One very interesting fact presents itself in this letter: "Every cloud has its silver lining. If the U. S. Government would raise the postage each year and have it go into effect July 1, maybe I could get your statement annually before I left for my vacation

and not have it follow me all over Europe as is generally the case. There is an advantage in being able to settle as many of one's affairs as possible before departing for the summer. So long as I depend upon a reminder from you, I am heartily in favor of receiving it while still at home."

The above statement coincides with the recommendation made by the auditor this year. According to the Constitution of the Society, the fiscal year closes June 30. The Treasurer's accounts are audited each year and this presented as the report of the Treasurer. If we waited until June 30 to close the books the audit could not be presented at the annual meeting of the Society. The auditor recommends that the fiscal year of the Society close on June 15. If this recommendation is approved by the Council we could then send out bills for dues before most of the members departed from their institutions for their much needed vacations.

Frequently we have requests for our mailing list so that information may be sent to our members by other organizations. Recently we furnished this list to the Department of Commerce and copies of the booklet "House Insulation: its Economics and Application" were sent to our members. We received a letter from Director Axel H. Oxholm informing us that "letters of thanks and appreciation have come in from all over the country. Your cooperation in helping us to bring this to the attention of your members is sincerely appreciated."

REPORT OF THE TREASURER, 1931–32

W. O. WILEY

STATEMENT OF CASH ACCOUNT
JUNE 20, 1932

BALANCE ON HAND—JUNE 12, 1931		$ 1,012.87
RECEIPTS:		
Current Dues	$10,908.00	
Back Dues	602.50	
Dues in Advance	112.50	
Sales of Publications	1,907.44	
Advertising	1,618.35	
Interest on Daily Balances	56.86	15,205.65
Total		$16,218.52
DISBURSEMENTS:		
Cost of Publications	$ 8,343.63	
Cost of Proceedings	379.87	
Honorarium for Secretary	1,200.00	
Salaries—Secretary's Office	3,300.00	
Traveling Expenses—Secretary's Office	344.46	
Printing, Postage and Office Supplies, etc.	899.26	
Committee Expenses	81.82	
Expenses—Purdue Meeting, 1931	566.87	
Expenses—Oregon Meeting, 1932	188.26	
Dues—American Council on Education, 1930–31 and 1931–32	200.00	
Dues—American Engineering Council (one half year)	125.00	
Pamphlets—Presentation of Lamme Award (to be repaid)	18.43	15.647.60
BALANCE ON HAND—JUNE 20, 1932		$ 570.92

Note—In addition to the above balance, there is on deposit at the Forbes National Bank, Pittsburgh, Pa., in Savings Account No. 3809 the amount of $6,000 with interest of $325.66 to June 1, 1932.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION
BALANCE SHEET
JUNE 30, 1932

ASSETS

Cash:		
Current Fund	$ 570.92	
Petty Cash Fund	300.00	
Life Membership Fund	700.78	
Benj. G. Lamme Fund	168.77	$ 1,740.47
Savings Account:		
Forbes National Bank—No. 3809		6,325.66
Securities:		
Benj. G. Lamme Fund		5,000.00

Prepaid Expenses—Oregon Meeting, 1932		188.26
Inventory		470.50
Accounts Receivable:		
Current Dues	$ 500.00	
Advertising	177.07	
Lamme Medal Fund	1,018.43	1,695.50
Furniture and Office Equipment (Estimated)		100.00
		$15,520.39

LIABILITIES

Life Membership Fund		$ 700.78
Benj. G. Lamme Fund		5,168.77
Prepaid Membership Dues		112.50
Surplus Account:		
Balance—July 1, 1931	$ 7,864.05	
Add—Unused Balance—Institutional Division—Personnel Problems Fund	827.72	
Surplus for this year	846.57	9,538.34
		$15,520.39

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION
INCOME AND EXPENSE ACCOUNT

AT JUNE 20, 1932

For the Year Ending June 30, 1932

EXPENSE

Cost of Bulletins	$ 7,243.63
Cost of Proceedings	379.87
Expenses—Purdue Meeting	653.21
Honorarium for Secretary	1,200.00
Salaries—Secretary's Office	3,300.00
Printing, Postage and Office Supplies	899.26
Traveling Expenses—Secretary's Office	344.46
Committee Expenses	81.82
Dues—American Council on Education	100.00
Dues—American Engineering Council	125.00
	$14,327.25
Surplus for the Year	846.57
	$15,173.82

INCOME

Current Dues	$10,955.50
Back Dues	602.50
Sales of Publications	1,907.44
Advertising	1,417.92
Interest on Daily Balances	290.46
	$15,173.82

COÖPERATION OF THE SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION WITH OTHER ENGINEERING SOCIETIES

R. I. REES,

American Telegraph and Telephone Company, Chairman

During this whole program the conviction has geen growing upon me that the interests of engineering education, of industry, and the engineers who are engaged in industry are vital and, in fact, one.*

Could anything be more strongly illustrative of this intimate association and the leaning of one element in this development on the other, than the splendid paper which we have just listened to by Mr. Holland?

What I am giving you this morning is the report of our committee on coöperation with the engineering societies. This committee was appointed because of the growing feeling, born of the work of the Board of Investigation and coördination, and the splendid individual efforts of Dr. Wickenden and Professor Hammond, that if we are to do our job in education we must have the full and sympathetic coöperation of our profession, and particularly of that part of the profession which forms the membership of the major engineering societies of the country.

At the beginning of the existence of the committee, when Dean A. A. Potter, Professors D. C. Jackson, J. W. Roe, and H. P. Hammond, and myself were appointed to the Committee on Coöperation with the Engineering Societies, we made informal contacts with the engineering societies at their headquarters in New York to try to determine what would be the best point of approach in offering our society's coöperation.

It was early discovered that one of the societies, namely, the American Society of Mechanical Engineers, had entered into a very complete investigation of its membership in the effort to determine the economic status of the engineer. Out of that investigation of economic status there came the conviction of the board that there was another matter involved in the problem which was of even more importance than the economic status, and that was the professional and social development of the engineer.

* This mutual interest lies chiefly in the consideration of our responsibility toward the individual during the time of passing through the engineering school into the engineering work of his life's career.

When President Lauer of the A. S. M. E., who prior to last December was chairman of this economic status committee, submitted the report to the membership at their annual meeting, the most important point he made was that if we were going to have a comprehensive, sympathetic, coöperative effort toward the enhancement of the profession and the development of the engineer, it would require joint action. It would seem appropriate, therefore, that that society should emphasize the need for joint action and invite attendance upon a conference for the consideration of what could be done to enhance the professional standards of the engineer, and particularly to determine what might be done for the development of the young engineer, in order that he might achieve full professional status. Such an invitation was extended by Mr. Lauer.

Let me just read two short paragraphs which were included in Mr. Lauer's invitation:

"Through this study (on the economic status) our committee has come to the realization that if the economic status of the profession is to be improved, the professional and social status must be improved as well. The profession itself must establish standards for selecting engineering students, must coöperate in their formal education, must take an important interest in their post-college training, and must provide a suitable goal of achievement.

"With this in mind our Council has approved a program entitled 'Certification into the Profession,' a copy of which is attached, and has requested me to extend to you an invitation to appoint three representatives to meet with representatives of the other societies to discuss the possibilities of joint action, and initiate a program of such action."

That invitation was responded to by representatives of the four founder societies and the Society for the Promotion of Engineering Education. The representatives designated by our president to attend the conference were members of the Committee on Coöperation with the Engineering Societies,—Professor Hammond, Professor Jackson, and myself.

The discussion developed a very sympathetic attitude toward this rather broad project, and the result of the discussion was the appointment of a planning committee to prepare a plan on the basis of the suggestions made by Mr. Lauer and to report back to a further conference of this group. Also, on motion before that conference, the American Institute of Chemical Engineers was invited to send representatives, and also, in order to have consideration given to the legalistic phases of the profession, it was moved that the National Council of State Boards of Engineering

Examiners be invited. Therefore, the organization of this congress comprised seven organizations.

The planning committee was made up of seven members, one from each of the participating organizations. The chairman of your committee was appointed chairman of the planning committee for the conference, and the other members were most representative of the other societies.

I might say just before proceeding to the final results, that Dr. Wickenden was a member of the conference representing the mechanical engineers, and Professor Scott was a representative for the electrical engineers.

The planning committee worked as effectively and as expeditiously as possible and was able to present the plan so that a meeting of a larger conference could be held on April 14 of this year.

It may be of interest to you to know the names of the representatives of the organizations.

American Society of Civil Engineers:

J. Vipond Davies
Harrison P. Eddy
C. F. Loweth

American Institute of Mining and Metallurgical Engineers:

E. V. Daveler
J. A. Mathews
T. T. Read

American Society of Mechanical Engineers:

C. F. Hirshfeld
J. W. Lawrence
W. E. Wickenden

American Institute of Electrical Engineers:

C. O. Bickelhaupt
H. A. Kidder
Charles F. Scott

Society for the Promotion of Engineering Education:

H. P. Hammond
D. C. Jackson
R. I. Rees

American Institute of Chemical Engineers:

A. B. Newman
H. C. Parmelee
F. W. Willard

National Council of State Boards of Engineering Examiners:

Hugh A. Kelly
T. Keith Legare
D. B. Steinman
P. H. Daggett (Alternate)

The plan was presented by the Chairman of the planning committee and was very thoroughly discussed, with a considerable amount of minor revision in phraseology, but adhering to the principles that the planning committee had presented.

Before reading the plan to you, I will just indicate some important actions taken at this conference.

"Voted: That each delegation in this conference be asked to present the plan to their separate governing bodies."

"Voted: That the coöperating bodies be requested to provide authority in the actions approving the plan which will permit the Council to be organized when five constituent bodies have ratified."

At this final meeting on April 14 the conference considered it had performed the function for which it was founded and appointed a small interim committee to receive the reports and refer them to the interested organizations. This committee consisted of Mr. Hirshfeld, who was chairman of the conference; Mr. Davies, who was secretary of the conference, and myself as the chairman of the planning committee. We are still unofficially functioning in that respect.

I should like now, gentlemen, to read to you the plan as it was developed in this conference, and which has been or is being submitted to the governing bodies of the organizations. I will read them once more.

"American Society of Civil Engineers
American Institute of Mining and Metallurgical Engineers
American Institute of Electrical Engineers
American Society of Mechanical Engineers
Society for the Promotion of Engineering Education
American Institute of Chemical Engineers
National Council of State Boards of Engineering Examiners."

Now this is a plan for joint action proposed by the conference on certification into the profession, a body made up of representatives from the societies which I have just read.

"I. *General Objective.*—The general objective of the proposed joint movement is the enhancement of the professional status of the engineer. To this end, it aims to coördinate and promote efforts and aspirations directed toward higher professional standards of education and practice, greater solidarity of the profession, and

greater effectiveness in dealing with technical, social and economic problems.

"II. *Immediate Objective.*—An immediate objective, now apparently practicable of attainment, is the development of a system whereby the progress of the young engineer toward professional standing can be recognized by the public, by the profession, and by the man himself, through the development of technical and other qualifications which will enable him to meet minimum professional standards.

"III. *Joint Action.*—These objectives can best be attained through the wholehearted coöperative support of those national organizations directly representing the professional, technical, educational, and legislative phases of an engineer's life," and the organizations whose names I read are again cited.

"The movement can go forward effectively only under the administration of a joint committee. It is suggested that this committee be made up of three representatives of each constituent body.

"IV. *Name.*—The name of the joint agency should indicate clearly the universal character of the movement and its objective. It is suggested that the joint committee be named 'Engineers' Council for Professional Development.'

"V. *Operation.*—The 'Engineers' Council for Professional Development,' if and when constituted, shall from time to time recommend to the governing boards of the several coöperating organizations procedures considered to be of value or significance in promoting the general objectives set forth, and shall administer such procedures as shall have been approved by those boards."

Just one comment there, gentlemen. You will realize that that operation places the committee in function as a general staff to make recommendations, and to leave the operation very largely to the societies themselves to carry out through their membership.

I do not think any of us considered that this was in any way a super organization. It is a staff functioning on the side to make recommendations to the governing boards of these organizations of worthwhile and effective procedures which will contribute to the development of the engineer.

"*Recommendation.*—The Conference on Certification, having duly considered the foregoing, has unanimously adopted it and recommends to the organizations thereon represented that they approve the plan as outlined and appoint three representatives each to the proposed 'Engineers' Council for Professional Development.' "

Now we come down to possible concrete actions, that is, a request for general authority to undertake this very large problem.

"*Proposed Initial Program.*—The Conference on Certification recognizes certain procedures which may be undertaken by the Engineers' Council for Professional Development immediately after its organization, and in view of the infrequent and scattered meetings of the governing bodies of the organizations here represented, it suggests that if these bodies act as above recommended, they also authorize Council to proceed with the following program.

"First, to develop further means for the educational and vocational orientation of young men with respect to the responsibilities and opportunities of engineers, in order that only those may seek entrance to the profession who have the high quality, aptitude and capacity which are required of its members;

"Second, to formulate criteria for colleges of engineering, which will insure to their graduates a sound educational background for practicing the engineering profession;

"Third, to develop a program for the further personal and professional development of young engineering graduates and a program for those without formal scholastic training.

"Fourth, to develop methods whereby those engineers who have met suitable standards may receive corresponding professional recognition."

You will at once recognize, gentlemen, that that initial program is focused on the young engineer, from a period before his entrance into the engineering college through a period of further development after graduation until he may receive that recognition which will give him professional status.

I can assure you gentlemen in the educational field that there was expressed no desire on the part of those representing the engineering societies to assume any dictatorial attitude toward engineering education in this problem of development. It was expressed frequently that the attitude of the engineering societies toward engineering schools and toward engineering education was that solely of helpful coöperation, and a desire to do only those things in support of engineering education that we here in the consideration of our interests feel will support us and serve us.

I think you will realize, as it was borne in on me more and more in the many discussions I have had in New York, that this program will stand or fall in accordance with the measure of support that is given by the engineering colleges. The whole plan is nothing more than an educational plan, carried on as it is most efficiently in the engineering schools of today, projected into the future, in order that there may be a continuing growth for the young engineer, in order that he may appreciate the objectives of the profession, and in order that he may grow steadily and be able to take

advantage of the opportunities which are offered him because of his own growing effectiveness.

The plan definitely dovetails with the vision of engineering research which was given to us by Mr. Holland and Dean Barker. It will be a stimulating influence to the young engineer. I, for one, hope that we can make possible the setting up of definite objectives for the young engineer to which he may aspire, and that at each stage in his development he will receive the recognition and the honor that is conferred upon him through that recognition by the members of the profession.

I should like to make one further remark on the fourth item of the initial program: i.e., The emphasis is entirely for individual development within the profession; and the objectives or hurdles of recognition will be developed through joint action and joint recommendation from this council to the societies.

Briefly this is the picture: a continuing development program; getting the right boys into engineering schools; giving all the support that the engineering schools demand from the profession; preparing a plan, a progressive plan, for the development of the young engineer up to full professional status; finally, as a reward for that, giving him professional recognition.

Gentlemen, I submit this plan to you for your consideration. It has seemed worthy to the group of us who have been laboring upon it in New York. We present it to you in all humility. We know it is not perfect, but it is the honest effort of a sincere group interested in the enhancement of the professional status of the engineer.

REPORT OF THE COMMITTEE ON SECTIONS AND BRANCHES

1931–1932

When the present chairman took over the duties of this Committee, there was in prospect, or under discussion, the organization of four new sections of the Society.

1. *Missouri Section.*—Under the leadership of Dean A. S. Langsdorf of Washington University, a member of this Committee, a meeting was held at Washington University, November 21, 1931, for the purpose of organizing a Missouri Section of the Society.

This meeting was attended by thirty-six representatives from Washington University, the Missouri School of Mines and Metallurgy and the University of Missouri. Dean A. S. Langsdorf was elected Chairman; Professor Harry Rubey of the University of Missouri, Vice-Chairman; and Professor H. H. Armsby of the Missouri School of Mines and Metallurgy, Secretary. Papers were presented at this meeting as well as at the informal dinner meeting the previous evening. A report of these meetings was published in the January, 1932, issue of the JOURNAL.

2. *Colorado-Wyoming Section.*—On April 16, Dean Jesse R. Morgan, a member of this Committee, called a meeting of delegates from the various engineering institutions of Colorado and Wyoming to discuss the organization of a Colorado-Wyoming Section.

A temporary organization was formed and Dean Jesse R. Morgan was elected President. Professor L. D. Crain, Colorado Agricultural College was elected Vice-President, and Professor Elmer O. Bergman, University of Colorado, Secretary.

3. *Northwest Section.*—Dean H. S. Rogers, a member of this Committee, hopes to be able to call a meeting of members from Oregon, Idaho and Washington, who are in attendance at the Annual Meeting of the Society, to discuss the organization of a Northwest Section. (See Supplementary Report.)

4. *Michigan Section.*—It has been definitely decided that there will be no organization of this section to report for the Annual Meeting of 1932. Dean Sadler, Professor Higbie and Director Spahr, the latter a member of this Committee, conferred upon this matter last spring, reaching the conclusion that no attempt should be made to organize a section until business and financial conditions in the State had improved.

It was agreed, however, that the present State Committee request each institution to supply the names of men on their staffs who have been doing something of interest to the other faculties, with a view of having the various engineering schools extend invitations to such men to speak before their local faculties. This, it is felt, might bring about acquaintanceship and perhaps serve, to some extent the same objectives as those of a State Section.

Additional correspondence has been carried on with reference to the organization of an Iowa-Wisconsin Section, a California Section and a Gulf States Section, the latter to include the states of Louisiana, Mississippi, Georgia, Alabama and Florida.

No definite conclusions have been reached at this time in any of these cases.

Throughout much of this correspondence the Chairman of this Committee has been interested to observe a reaction, quite explicitly stated in some instances, implied in others, which may, perhaps, be best expressed by the following quotation from a letter in the files of the Committee:

"My opinion is, therefore, that the creation of an S. P. E. E. section in any territory should be in response only to an enthusiastic and spontaneous demand from at least a dozen engineering teachers, full of ideas and keenly interested in the ideas of others."

This Committee desires to express its appreciation for the cordial and effective coöperation which has been given by the officers of the different sections and branches in furnishing information to its Chairman concerning their activities, as well as to the Secretary of the Society for publication in the JOURNAL.

Respectfully submitted,

DOUGLAS ANDERSON,
Chairman of Committee on Sections and Branches.

SUPPLEMENTARY REPORT OF THE COMMITTEE ON SECTIONS AND BRANCHES

Individual conversations and informal conferences with members from the Pacific Coast states during the progress of the Annual Meeting indicated an earnest desire on the part of many for the organization of one or more sections of the Society for that region.

A luncheon meeting was arranged for Thursday, June 30, at which your Chairman was requested to preside. This meeting was attended by practically all the members from the Pacific Coast and Northwestern states.

Brief statements were made by the Chairman, by Secretary Bishop, and by Professor H. B. Langille of the University of

California. After some discussion a resolution was passed that it was the sense of the meeting that two sections should be organized, one to include the Northwestern states of Oregon, Washington, Idaho and Montana, the other to include California and the bordering states of Nevada and Arizona, should these latter desire to come in.

A second resolution was passed directing the Chairman of this Committee to appoint two special committees who would be authorized to proceed with the organization of these two sections.

In accordance with this resolution the following committees have been appointed:

For the Northwest Section

Dean H. S. Rogers, Oregon State College, *Chairman*
Dean R. G. Tyler, University of Washington
Dean I. C. Crawford, University of Idaho
Dean W. M. Cobleigh, Montana State College.

For the California Section

Professor H. B. Langille, University of California, *Chairman*
Professor A. B. Domonoske, Stanford University
Professor T. T. Eyre, University of Southern California
Professor Franklin O. Rose, University of California.

Respectfully submitted,

DOUGLAS ANDERSON,
Chairman of Committee on Sections and Branches.

THE 1932 SESSIONS OF THE SUMMER SCHOOL FOR ENGINEERING TEACHERS, S. P. E. E.

By H. P. HAMMOND, Director

The two sessions of the Society's Summer School mentioned in issues of the JOURNAL last spring were held as scheduled: that on the teaching of economics at Stevens Institute of Technology, from July 5 to 21, inclusive; and on English, at The Ohio State University, from July 11 to 28, inclusive.

While not equal in numbers to the sessions of the past two or three years, the attendance was excellent. A total of 76 teachers was enrolled, 37 at the economics session and 39 at the English session. The two groups were as representative of the sections of the country and of the teaching ranks as in former years. Teachers from 45 colleges in 22 states were included in the two groups. Among those in attendance were 1 president, 2 deans, 1 junior dean, 21 professors, 6 associate professors, 12 assistant professors, 22 instructors, and 11 assistants, lecturers, and teachers of other ranks. It was interesting to note that several of those present at the English session were teachers of engineering subjects who had no direct responsibility for the teaching of English, but were present for the purpose of coördinating their own instruction with work in English.

Undoubtedly the most conspicuous single feature of the two sessions was the able teaching staffs that were assembled. That on economics was headed by President Harvey N. Davis, of the Stevens Institute of Technology. Vice-President James Creese, and Professor William D. Ennis, also of Stevens Institute, served respectively as Secretary and as Chairman of the Teaching Staff. The staff at the economics session comprised three groups of men: (1) teachers of general economics, such as John M. Clark, of Columbia, F. R. Fairchild and Irving Fisher, of Yale, William Z. Ripley, George B. Roorbach, and Clinton P. Biddle, of Harvard, A. Wellington Taylor, and Louis H. Haney, of New York University, Seymour S. Garrett, of Cornell, and Joseph H. Willits, of Pennsylvania; (2) teachers of economics and related subjects to engineering students, including E. L. Grant, of Stanford University, Walter Rautenstrauch, of Columbia, John R. Bangs, Jr., of Cornell, A. M. Greene, Jr., of Princeton, and Joseph W. Roe, of New York University; (3) a group of lecturers from the field of industry and engineering practice, including Ralph E. Flanders,

of the Jones and Lamson Machine Company, W. F. Hosford and W. R. Burgess, of the Western Electric Company, E. W. James and W. F. Sawyer, of the U. S. Government Departments, George Orrok and W. A. Shoudy, consulting engineers, and a number of others. Consulting economists in private practice were also included, such as K. W. Jappe, and Warren M. Persons.

The staff of the English session was headed by Professor Sada A. Harbarger, of The Ohio State University, Chairman of the Society's Committee on English. Mr. Wilson R. Dumble, also of The Ohio State University, served as Local Secretary. The staff included such men as Earl B. Taylor, of Rochester, Ray Palmer Baker, of Rensselaer, Edwin Mims, of Vanderbilt, S. Marion Tucker, of Brooklyn Polytechnic Institute, H. G. Pearson and A. T. Robinson, of M. I. T., C. W. Park, of Cincinnati, H. L. Creek, of Purdue, Raymond Walters, of Swarthmore, H. S. Leach, of Lehigh, J. R. Nelson, of Michigan, and A. C. Howell, of North Carolina.

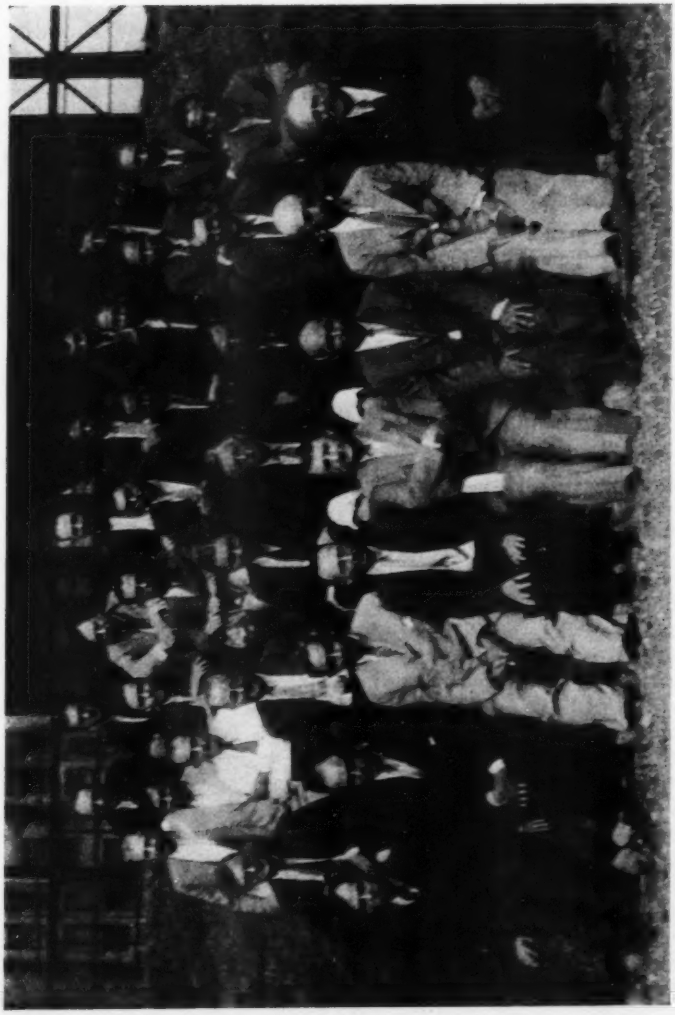
The programs of the two sessions proved to be valuable and interesting, according to the testimony of those who attended. Each of the programs was divided into three major parts. Those of the economics session were: Part I study and discussion of content of courses and methods of teaching general economics, economics of engineering, accounting, and related subjects. Part II was virtually an intensive, short course in the elements of general economics. Part III was devoted to current economics problems and to applications of economics in industry.

The three divisions of the English program were: Part I, a study of general principles of teaching; Part II, content of courses and methods of teaching English in engineering colleges, with particular reference to composition, literature and oral English; Part III, aspects of teaching English not specifically relating to work in engineering colleges and to results of English teaching as evidenced by abilities of engineering graduates. It is worth recording that Part I of the program was unusually valuable. Professor Earl B. Taylor delivered this series of lectures on the general principles of teaching.

As to general impressions, the writer is inclined to believe that the sessions of 1932 were, all things considered, among the best that have been held. Each year it is possible more fully to realize on the possibilities of the Summer School sessions.

A number of the papers resulting from the sessions will be published in this and later issues of the JOURNAL and will appear also as separately bound bulletins of the Summer School series.

ENGLISH SESSION, S. P. E. E. SUMMER SCHOOL FOR ENGINEERING TEACHERS, OHIO STATE UNIVERSITY, JULY 11–28, 1932



ECONOMICS SESSION, S. P. E. E. SUMMER SCHOOL FOR ENGINEERING TEACHERS, STEVENS INSTITUTE OF TECHNOLOGY, JULY 5–21, 1932

A COURSE IN GENERAL ECONOMICS FOR ENGINEERING STUDENTS *

By SEYMOUR S. GARRETT

Professor of Industrial Economics, Cornell University

In our American engineering colleges it is usual that a student taking economics shall begin with an omnibus course which contains a little economic history, an account of our present organization for economic life, an outline of generally accepted theory, with some discussion of disputed points of theory and of possibility of economic betterment. The giving of such a course seems to have been dictated by considerations of practical necessity and not by an analysis of the ideal way of mastering the subject. For those students who take additional work in the field of economics, this course is followed by others which deal with specialized parts of the field: labor problems, the trust problem, money and banking, corporation finance, industrial fluctuations, history of economic thought, and what not. The general course in economics is almost always made a prerequisite for these special courses but as to most of them there appears no very good reason why this should be so. As most of the special courses are commonly given they lean to a very slight degree on the supposedly necessary preliminary general course and they could, without serious loss, be modified so as to stand completely on their own foundations. Even now a student who had not taken the general course would find little more difficulty in pursuing one of these special courses successfully than students with the background of the general course. On the other hand, students who had previously laid a foundation by taking courses in economic history, in business organization, in marketing methods, in economic geography, in money and banking, in business law, and in labor relations would be prepared for a course in general economics which could be made much more valuable than it is possible for the introductory course to be.

To give such a sequence of courses for all engineering students is without doubt impracticable under present conditions. A single course in economics, and that sometimes drastically curtailed, represents the utmost that those in charge feel they can crowd into the curriculum without displacing things thought vitally necessary in fields directly in line with the work which the student is preparing

* A lecture delivered at the Economics Session of the S. P. E. E. Summer School for Engineering Teachers, Stevens Institute of Technology, July 7, 1932.

to pursue. Even if, presently, courses for engineering students come to cover five or six years, progress will make such growing demands on engineers for knowledge of the physical sciences and of the engineering arts, that it will seem little easier to find place for extended training in the field of economics than before. Though it may be heresy, I am not at all sure that for men preparing to practise the older branches of engineering extensive work in economics is desirable. The opposing belief has come, I think, because we have been giving training in the same courses to men who are preparing for strictly professional work and to others who look forward to something quite different.

Now, however, there are beginning to be offered new curricula especially designed for those who expect to go into business positions where their engineering knowledge on the physical side will serve as a valuable background rather than as a direct tool. In these curricula there is quite naturally included a considerable amount of work in the field of general economics and in related fields. For example, the course which we inaugurated last year at Cornell, leading to the degree of Bachelor of Science in Administrative Engineering, while retaining the basic mathematics, physics, and chemistry, of the older courses, as well as much of the work dealing with the physical side of the art of engineering, has some of the latter type of courses lightened to make room for about forty semester hours of accounting, cost accounting, statistics, business and industrial organization, industrial engineering and management, money and banking, corporation finance, investments, marketing, and business law.

These courses now follow the course of five semester hours, in general economics given in the Sophomore Year. Obviously however, we have here an ideal opportunity to make the experiment of using the reverse order. I hope that presently this will be done. I am confident it will give decidedly better results. However, that is for the future. While it might be interesting to discuss the course which could be given on a foundation previously laid by courses in accounting, statistics, marketing, money and banking, industrial organization, and business law, it will doubtless be more practically useful to give our attention to the type of course now actually given and which must continue to be given to a large fraction of all engineering students.

The field which may be embraced by general economics is so broad that there is no possibility of covering it thoroughly in a single course of three, five or six semester hours. We must perforce make a choice between sketching in salient features over a very broad area, and over much of the field doing nothing more; or else, if we insist on more intensive treatment, leaving much of the pos-

sible field quite untouched. Again there will be a wide possible variation of content according to the end at which we aim. This may be narrowly utilitarian. In that case material will be included or excluded primarily because it is thought that the future engineers will find it directly and practically helpful in the performance of their professional work. I feel that while much that will come in any course in general economics may prove directly serviceable in the work of many of those who take the course, this should be regarded as a consumer's surplus, so to speak. The primary object should be to broaden interests and to liberalize attitudes, rather than directly to increase professional skill. For the student the gain from his study of economics should be rather of the sort which comes from being able to speak grammatically than the sort which he expects from his study of mechanics or thermodynamics. Such satisfaction is compounded of complex elements which, as Veblen clearly showed in his Theory of the Leisure Class, are not all of them creditable to human nature, yet in the case of economics there is, when it is taught with imagination, abundant opportunity for the learner to experience a satisfaction wholly admirable.

It may be asked why if this be the aim, economics rather than some other subject of cultural value is so generally placed in engineering curricula. As a matter of fact I suspect that engineering faculties have sometimes builded better than they knew. I imagine they have thought the connection with economics of engineering would be somewhat closer than has usually been the case. It is possibly significant that in 1891 when the Faculty of Civil Engineering at Cornell added a course in Political Economy, they dropped one in Economical Engineering which had been given for many years. Seriously, of course, even though we emphasize the cultural aspect, there is much weight in the fact that economics is more closely related to the subject matter of engineering than probably any other subject not actually in the engineering field.

Direct gain to the student, however, is not the sole consideration, or at least should not be, when laying out courses in American educational institutions. It is proper that the college curriculum should pay some attention to making the graduate a useful member of the community quite irrespective of any direct gain to the man's personal fortunes. In adding economics to the curriculum of the engineering school a faculty does it best to fulfill this duty. If the course as actually taught sometimes fails to attain the aim, that is true also of other courses.

Now what of the specific content of the course? There is so much ground to be covered in any adequate study of the organization and working of our existing economic arrangements that the temptation is strong to confine attention to just that. Perhaps if

the time allotted is not more than three semester hours this may be wise. Where more time is allowed I think it is highly desirable to give considerable attention to economic history and at least a little time to industrial geography. This of course means that some parts of the study of the present-day system must be much more sketchy than would otherwise be the case, but I think the gain considerably outweighs the loss. By economic history I mean primarily what would be perhaps better described by the term economic development. I want the student to be able to visualize the sweep of our ancestors' progress in the fields of mechanical technique and in business practice. I want him to be able to trace the important steps in both sorts of progress and to have an idea of their relation one to another in point of time. Precise dates I never ask the student to remember, but I do ask him to memorize a rough time scale with some of the outstanding developments approximately placed upon it. I ask him to know something of the range of estimates as to the time since man appeared, how far back we find him using stone implements, approximately when and in what order appear the wheel, pottery, domesticated animals, the growing of grain, the use of copper and iron, when the great river civilizations arose, when they were overshadowed by those of Greece and Rome, when the western part of the Roman Empire was submerged under the barbarian flood, when the revival of learning flowered, and when there occurred the series of changes we call the Industrial Revolution.

In dealing with the early civilization I try to bring out how in the long struggle by which man has endeavored to make himself master of his geographic environment that environment seems to have controlled the time, place, and to a great extent the direction of development. I try to show, too, how amid a great variety of political and social organizations, each with many peculiar and often shortlived economic practices and institutions, certain particular practices and institutions have emerged with great regularity and have persisted. Lastly I continually draw attention to the repeated examples seeming to show that any sort of economic prosperity is dependent on the attainment of reasonable security for person and possessions. Throughout, however, I am careful to make it clear that such lessons as we think to draw from history must not be taken as something following of necessity from what we know of particular events in the past. Anyone who has attempted to make experiments in a physical laboratory knows how easily one may be misled by reading significance into nonessential facts or by failing to take account of something which looks unimportant but proves to be important. If this can be true under the controlled conditions of the laboratory how much more must it be true in the field of economics. Here we have no controlled ex-

periments. Our knowledge of any situation and of the influences which led up to it is, and will always be, fragmentary and in part inaccurate. It is always possible, especially in the case of events long past that some of the most important data are lacking. What I think the student should get from the survey of economic history is rather a general feeling for the way in which economic forces operate than to have thrust upon him particular conclusions from particular events.

I do not think we are justified in concluding that nothing can be learned from economic history. I think the one thing we must not do is to close our minds when we have accepted some specific explanation of an event as plausible. But such truth is never of the sort we find in a geometric proposition. Primarily the value of economic history is in the general impression it creates, the background which it lays for the study of the economic system of today.

I said above that the impossibility of drawing valid conclusions directly from the observation of events applied as well to current as to past economic affairs. I am aware that there is at the present time, and has been for some time past, a disposition to assume generalized theory unimportant. It is assumed that detailed statistical inquiry will itself reveal truth aided only by common sense and general information. With this view, engineers, because of the nature of their own work and of their triumphs, have a natural sympathy. They instinctively applaud what they denote as an appeal to facts instead of theory. What they forget, and sometimes do not even sense, is that the problems of engineering and of economics present large differences of kind. This is partly because the phenomena with which engineering deals occur in simpler form than those of economics. It is commonly possible to see without conscious effort just what is the nature of the data needed for a proper solution. Also the basic generalized theory within which the engineer works has been developed so long since that he uses it automatically and almost unconsciously. It is my own very firm belief that the so-called appeal to the statistical facts in economics is in itself sterile. Until the statistical data have been carefully fitted into their place in a coherent *generalized* theory there is almost never any possibility of drawing a conclusion which will be anything more than a mere opinion—the sort of a thing that might come from any man in the street. Statistical data are the warp of accurate economic thinking, but generalized theory is its woof. Either is literally useless without the other. Note that I say *generalized* theory. Theories applying to particular parts of the field are not sufficient. We are dealing with an economic system, the inter-relation and interaction of whose parts is as definite and intimate as that of the parts of a biological organism. I think that

the answers returned to economic questions on the basis of pure statistical inquiry and so-called common sense, even where there is called to aid a specialized theory dealing with only a part of the field, will be in error more often than not. There seems to be a kind of fatality whereby our common sense leads us to consider only data which taken alone point in the wrong direction.

It is of course not possible to reason without theory. One can erect an imposing structure of theory on the basis of a very slender array of actual data. It is fascinating but dangerous. But one cannot draw conclusions from facts without the presence in his mind of some sort of theory. We only fool ourselves when we think we let the facts speak. When we do so we simply draw conclusions on the basis of the uncriticised, chaotic and probably contradictory theories which chance to have found lodgment in our minds, instead of using ordered theory which has been brought up into the light of day and subjected to careful criticism.

Neither at the outset of the course, nor later when we come to consider the organization and working of our present economic arrangements, do I think that an attempt at formal definition of economics is useful. It is much more illuminating to give a sample list, representative of the questions which economics tries to answer—questions such as those with which Henry Clay begins his "Economics for the General Reader." How does it happen that when we need some article, say a shirt, we can go to a store and expect to find it? How does it happen that we must pay three dollars for it and not two or four? Why does the worker who sews the shirt get so many cents per shirt or per hour and not more or less? How does it happen that sometimes it is easy to find some one who will pay us for sewing shirts or for almost anything else that we think we can do and that at other times we can find no one who will pay us for sewing shirts or for any other work? And so on, until the list is as comprehensive as we please.

The attempt to answer the first of the above questions leads to a survey of all the main features of our economic arrangements. The others, so far as we have followed them, all center in the theory of market price. But if we had followed through the list we should have come to a series of questions of a quite different order. They would have asked not what is, but what ought to be, and whether and to what extent existing arrangements could be revised to give a more socially useful result. I think it is well to impress upon the student at the outset the fundamental distinction between these two types of questions. He should be brought to recognize that the first type can be answered without reference to the second. That the description of our economic arrangements as well as the theory and actuality of their working constitutes a branch of science com-

plete in itself. He should be warned, too, with considerable emphasis that though welfare economics, to be useful, must make the fullest use of economic science, the interposition of welfare economics in the study of the science is likely to be fatal to the science. Our sympathies and prejudices are too much involved. Wishful thinking is not logical thinking.

I have insisted on the importance of general theory in the study of economics as science. Possibly, however, I do not mean by theory just what the term implies to many of my hearers. Much of the so-called theory of economics seems to me to labor prodigiously over points which are more mysterious after the theorist has finished than they were in the beginning. What I have in mind when I say theory is the statement and tying together of all the really essential facts about the whole price system and the reactions by which prices guide and control and sometimes curtail economic activity and progress. This is something which the standard textbooks almost ignore. They give an unnecessarily elaborate discussion of the determination of market price for a particular commodity under assumed conditions which lack reality. They give a discussion of the relation between price level and quantity of money. Then in separate divisions of the book they discuss rent, interest, profits, and wages. Nowhere is the attempt made to show how the fact that the money supply governs the possible money volume of trade not only means that the commodity price level and the volume of industrial production are tied together but that the wage level is likewise tied up inextricably in the same bundle so that no one can be usefully dealt with except as expressly related to the others. For myself, the usual discussions of wages, whether the writer inclines to the bargaining theory or to the so-called productivity theory, seem to have very little content of true meaning. It seems to me that when the discussion is left where our textbooks leave it, more harm than good has been done. The discussions, because of their failure to include the necessary breadth of field, arrive at invalid and sometimes incorrect conclusions and, worse, teach by example a viciously faulty habit of thought. This is strong language but I believe not too strong.

Not only does the careful tying together of the facts of market price into a systematic theory lead to some sharply different conclusions than the piecemeal treatment of the textbooks, but it makes clear that a considerable amount of material usually thought important is actually nearly irrelevant detail. Thus while it is not wholly easy to manage the multiple quantities which must be carried along in parallel, in the use of the comprehensive theory, there is some compensation in the smaller amount of detail which must be covered. The key to the reduction of the comprehensive theory

to a usable working system is, by the way, to recognize that in the attempt to explain an existing price system directly, we are attempting an impossibility. The thing to do is to explain price changes. Then paradoxically we have attained the impossible and have explained the price system. For the price system which exists is essentially nothing but the sum total of all the changes which have taken place since the beginning of trade.

Now, how much attention should be given to welfare economics. I suspect this will vary widely with the personal feelings of those who teach the course. To me it seems that, first having laid a proper foundation of economic science, an inquiry of rather broad scope into the problem of promoting welfare is very much in order.

Criticism of the productivity theory of wages should already have served to make clear to the student the utter absurdity of trying to impute to any one of the thousands of workers who contribute to the production of even the simplest good a specific share in the resulting product. I tell my own students that it is like asking how much of the stability of a three legged stool resides in each particular leg. By one method of approach it can be shown that all the stability resides in a particular leg since if it is taken away there is no stability left. But equally clearly, none of the stability resides in that leg since if the other two are taken away and that one left the stool has no stability. In the same way where a whole series of operations is necessary to produce an economic good the worker who performs any one of these operations can with equal plausibility be said to contribute the whole value or none of it. Of course the real answer is that the question of his contribution to the value has no answer. Having grasped this point, therefore, the student is prepared to see—though not always easily—that the income received from participation in our complex economic life can not measure his contribution to the sum of economic goods in the sense that the spear or canoe produced by the savage working individually do so. Furthermore the effort of the ablest of men, working unaided would suffice to bring him only an infinitesimal part of what, if a successful man, he draws from the present arrangement. Thus finally the conclusion can be fairly drawn, that how much of the income of each individual shall be left to his individual use and how much taken for communal use, is solely a question of social expediency and not in any sense a matter of individual rights and wrongs. The way is then open for a discussion of the best proportion of governmental and cooperative activity to activity for private profit; of the criteria, if any, which may guide us in choosing one or the other form of production; and of the possibilities and dangers involved in a change to complete governmental absorption of industrial production.

The T-SQUARE PAGE

DEVOTED TO THE INTERESTS OF THE DIVISION OF ENGINEERING DRAWING

FREDERIC G. HIGBEE, EDITOR

Corvallis Meeting. The Engineering Drawing Division held two meetings, the annual dinner meeting being attended by forty-four persons, many of whom were administrative officers. In the absence of Chairman H. M. McCully, Professor Thomas E. French presided. The subjects presented and discussed were: The McCauley tetrahedron placement test, the Mann Cube test, and the competition in engineering drawing. At the business meeting the following day, the report of the nominating committee was accepted and the following officers were elected: H. M. McCully, Chairman; Justus Rising, Secretary; F. G. Higbee, Editor of the T-Square Page; and Professor F. M. Warner, University of Washington, member of the Executive Committee. Professor Fred Merrifield presented a paper on "Can a practical problem in Engineering Drawing be made to carry the theoretical principles of Descriptive Geometry?" Professor F. M. Warner presented a paper on "Practical Problems in Descriptive Geometry." The division authorized the executive committee to appoint a committee "to study and formulate rules and regulations for an annual competition in Freshman drawing work with proper awards for proficiency."

The Drawing Competition. A total of 43 drawings in blue print form were submitted by 11 institutions as follows: Brooklyn Polytechnic Institute, Case School, Idaho, Illinois, Iowa, Missouri, Northwestern, Ohio, Rice Institute, Union College, Wisconsin. The local committee selected eleven prints for the competition, one from each institution. The Judges: Professor R. H. Davis, California Tech; Dean Dexter S. Kimball, Cornell; Mr. C. E. Carey, Westinghouse, selected the winners as follows: Union College, first; Brooklyn Polytechnic Institute, second; University of Missouri third. The eleven judged prints are now available for a traveling exhibit to those members who apply for it. In order to route the exhibit efficiently, application should be sent to the editor of this page at once.

For 1932–1933: Suggestions, material, ideas, problems, news for this page are welcomed.

DISCUSSION OF "VISUAL EDUCATION EXPERIMENTS GIVE TANGIBLE RESULTS" BY J. M. MILLER, RICE INSTITUTE

By SAMUEL B. FOLK

Ohio State University

Professor Miller's short and concise article under the above heading, appearing in the May, 1932, issue of the JOURNAL OF ENGINEERING EDUCATION, should bring clearly to the attention of the faculties of engineering colleges the need of a well-planned and searching study into the question of education by motion pictures. It is unfortunate that Professor Miller's article was so short that many details are left to be supplied by the reader. Occasionally these details concerning the manipulation of the experiment are of such importance that a change in the methods of handling the administration or the subject matter might tend to reverse the results. In the interest of clarity and in order to enable Professor Miller to furnish more details, a few of the questions which might arise in the mind of the reader are raised here.

(1) The paper stated that the lectures given to groups "A" and "B" were of the same duration. If group "A" had as much lecturing as "B" and in addition had moving examples of planes revolving in space on the silver screen, then one might conclude that "A" had been given more time than "B."

(2) If the length of the lecture plus the pictures for "A" was the same as for "B" then the lectures must have been somewhat different in the two sections, and one concludes, perhaps, that too much lecturing is detrimental, although some is necessary and if it can be profusely illustrated will be still more beneficial.

(3) One wonders if the lectures were given to both sections by the same man. If so, this would normally be considered a constant, although a good teacher cannot but feel the response of the class. Thus, petty interruptions, spontaneous outbursts, drowsy students, tardy arrivals, noisy classrooms or poor hours on the scheduled day tend to contribute to unsatisfactory lectures. Did you ever feel on completing a lecture that you could do a better job if you had a chance to repeat it next hour? Did you ever feel that the second or third time you gave a lecture, some of the enthusiasm seemed to have vanished, and, like the over-coached football team, you became "stale"? Thus, while we recognize that different instructors have varying degrees of success in presenting a subject so the stu-

dent can grasp and utilize it, so we must see also that the same instructor may be more successful with one section than with another, and perhaps even though the I.Q.'s of the two sections are approximately the same.

(4) It is always doubtful, of course, if the two sections have been divided properly. Even though intelligence tests are used to get the ratings, there is always some doubt about the relative abilities on new problems, or the astonishing accomplishments which may be obtained by hard consistent efforts over long hours by students with mediocre I.Q.'s. Another method sometimes used is to pair the class, using grades in a previous subject which requires the same traits and abilities as this one. Here, however, there is little chance to size up the students in the freshman year before descriptive geometry.

Showing "B" all the back films which "A" had seen with their lectures is, in effect, a review of the subject. After fighting the problems on tests and learning where the trouble lay, an illustration in the form of moving pictures would be a great help in connecting the broken concepts of the subject and explaining difficult points.

(5) There seems to be some reason, not explained in Professor Miller's short article, why the average grades on five of the seven tests show such a uniform difference (3.1, 3.6, 2.8, 2.9, and 4.4, averaging 3.4) in favor of "A" while the fifth test gave 9.4 and the seventh 28.5 per cent. higher marks for "A." Perhaps our visual education methods ought to be first concentrated upon the subjects treated in the fifth and seventh tests, since this is where the greatest improvement can be made easily and quickly by films.

(6) Some mention ought to be made of the tests; how they were constructed and by whom, since validity and reliability of the results depend on those characteristics of the tests themselves. Perhaps to be most valid, the tests should be made up by some one not teaching the course that particular semester but one in the department and thoroughly familiar with the work. If one knows the peculiarities of the methods used by teachers in a department, one can devise a test which brings out these emphasized topics, or one can devise a test which, while perfectly legal and not outside the scope of the work, will mislead the student, trained to use these certain, definite, and peculiar methods. Perhaps in this case the tests should be made up by an instructor who was teaching the course but had not seen the films, else there might be an urge to put on a few questions which were clearly demonstrated in the films. Instructors in many engineering departments do not recognize that the questions, while valid enough, may not be a reliable guide to the students' ability to handle the subject. It is unfor-

tunate that the quiz questions are often concocted in a few minutes before going to class. This, I have a feeling, is probably not so true in a course in descriptive geometry as in some other lines of endeavor. Any tutor can drill certain type problems into his pupil, who will, after a fashion pass the usual repeated type examination. The student who cannot pass except by this means on a handed-down examination is not wanted in engineering work. Every effort should be made throughout the college curriculum to "spring" new situations and unexpected combinations of data for the student to digest, classify, refine, and fabricate. Of course it must be added that these new and different problems can hardly be made simple enough and close enough to the fundamentals.

Professor Miller is to be congratulated on his efforts in visual education on a subject like descriptive geometry. The writer is frank to admit that these remarks are not prompted by a scholarly grasp of the subject, but hopes that Professor Miller will enlighten us further on his work and encourage us in other fields by his plans for further achievement.

DIVISION OF MECHANICS

Your Committee on Nominations begs leave to recommend:

1. That the Executive Committee of the Division shall consist of eight members, two of whom shall be elected at each annual meeting for terms of four years.

2. Based on duration of previous service on the present Division and the former Committee of Mechanics, the terms of the present members shall expire as follows: Professors A. P. Poorman, G. P. Boomsliter, and S. M. Woodward at the close of the Annual Meeting of 1932; Professors E. R. Maurer and E. W. Rettger at the close of the Annual Meeting of 1933; Professors N. C. Riggs and LeRoy Tucker at the close of the Annual Meeting of 1934; and Professors S. B. Folk and H. D. Churchill at the close of the Annual Meeting of 1935.

3. That a Chairman shall be elected from the members of the Executive Committee for a term of one year, and a Secretary for a term of two years.

Your Committee nominates:

For members of the Executive Committee, to serve until the close of the Annual Meeting of 1936:

Professor F. B. Seely, University of Illinois,
Professor A. E. Norton, Harvard University.

For Chairman of the Executive Committee:

Professor E. R. Maurer, University of Wisconsin.

For Secretary of the Executive Committee:

Professor N. C. Riggs, Carnegie Institute of Tech.

Respectfully submitted,

C. E. FULLER,
S. G. GEORGE,
J. E. BOYD, *Chairman.*

SECTIONS AND BRANCHES

The spring meeting of the **Middle Atlantic Section** of the Society was held at Swarthmore College, Swarthmore, Pennsylvania, on Saturday, May 7, 1932. One hundred and five members and guests were in attendance, representing sixteen educational institutions and seven firms.

A number of members, under the leadership of Professor Scott B. Lilly, visited the West Philadelphia improvements of the Pennsylvania Railroad and the construction on the subway. The majority of the delegates spent the time before luncheon inspecting the buildings and grounds of Swarthmore College. Headquarters was in Hicks Hall. The college served a complimentary luncheon to the members and guests in the new dining room, Parrish Hall.

The main business session was called to order at 2:15 by Chairman Robert C. Disque of Drexel Institute, in Hicks Hall auditorium. After the reading of the minutes and the treasurer's report, Professor Charles G. Thatcher of Swarthmore College, presented in brief the topic, "Honors and Comprehensive Examinations at Swarthmore." This was discussed in an interesting manner by a number of the visiting members.

A very fine and inspiring paper on "Philosophic Concepts in Physics" was presented by Dr. W. F. G. Swann, Director of the Bartol Research Foundation, Swarthmore, Penna. Following his address, Dr. Swann conducted the members through the laboratories of the Bartol Foundation.

Dinner was served to seventy-eight members and guests at 7:00 o'clock in Parrish Hall. Dr. John A. Miller, Research Professor of Astronomy and Acting President of Swarthmore College, spoke on his long and intimate contact with engineers and engineering students.

The report of the Resolutions Committee was as follows:

"The Middle Atlantic Section of the Society for the Promotion of Engineering Education has appreciated the opportunity to become acquainted with Swarthmore College, in its beautiful surroundings and with its dignified campus and buildings, which so fitly contain and express its high standard and tradition of scholarly effort and attainment.

"To the College, to the Engineering Faculty and to the Committee in charge of arrangements, we tender our thanks for hospitalities extended and for the excellent program laid out. We are interested in the honors course at Swarthmore and were enter-

tained and enlightened by the awakening address of Dr. Swann, reinforced by inspection of the Bartol Research Laboratories.

"Through the Committee we would thank the Pennsylvania Railroad Company for permission to inspect the 30th Street Station development.

"The cordial words of Dr. Miller, with commendation of the activities of the engineers, are much appreciated.

"The double-header athletic entertainment was enjoyed by many of us, as was bowling on the green by others. The whole program has been interesting and inspiring, and we again wish to thank all who contributed to it."

(Signed) ROBERT C. H. HECK, Rutgers University,
J. HARLAND BILLINGS, Drexel Institute,
GEORGE W. FARNHAM, McGraw-Hill Co.

This report was unanimously accepted.

The Section then adjourned to meet at Newark, New Jersey, for the annual meeting in the fall of 1932.

CHARLES G. THATCHER,
Secretary.

The **New England Section** will hold its fall meeting at the University of Maine at Orono, on Saturday, October 8. The program is in the hands of Dean R. R. Marsden, Secretary, Thayer School of Civil Engineering, Hanover, New Hampshire, and Professor James A. Hall, Chairman, Brown University, Providence, Rhode Island.

Professor Hall in coöperation with Professor Doherty of Yale and Professor Bush of M. I. T., are arranging a splendid program.

COLLEGE NOTES

University of Southern California.—During the past year a small hydraulics laboratory has been installed in the basement of Bridge Hall, as the result of several gifts. This made it possible to add regular laboratory work to the elementary course in hydraulics.

Lacking a steam laboratory on the campus, in the past it was necessary to do such work off campus. During the last semester some equipment was installed in the boiler room of the new physical education building, which makes possible steam laboratory testing on the campus.

Arrangements are being made with the A. Lietz Company, whereby they will provide the College of Engineering with several rain gages of various types and sizes, in order that a comparative study of such gages may be made.

Promotions for the coming year are: Sydney F. Duncan, from Instructor to Assistant Professor of Mechanical Engineering; Gilbert H. Dunstan, from Instructor to Assistant Professor of General Engineering.

Due to the death of Dr. W. W. Scott, Chairman of the Division of Chemical Engineering, Dr. Paul H. M. C. Brinton and Mr. R. B. Stringfield have been appointed to give work in chemistry and chemical engineering for the coming year.

University of Vermont.—Prof. George F. Eckhard has been appointed dean of the College of Engineering, University of Vermont, succeeding the late Dean J. W. Votey.

Mr. Eckhard came to Vermont in 1915 from Penn State College as Professor of Structural Engineering. He is a graduate of the University of Iowa in the class of 1905. In 1910 the University conferred on him the degree of C.E. He is a member of Sigma Xi.

BOOK REVIEW

Prospecting and Exploration. By R. C. MATSON, Associate Professor of Mining and Civil Engineering, Michigan College of Mining and Technology. Published by Michigan College of Mining and Technology, Houghton, Mich. 45 pp. 60 cents.

An outline of prospecting methods and practice. In addition to the usual modern surface methods, boring as a means of prospecting for covered deposits is included. Recent improvements in practice are noted. Among these, geophysical prospecting in its various phases is given nearly one half of the total space. The book is intended for elementary classes in mining.

R. M. B.